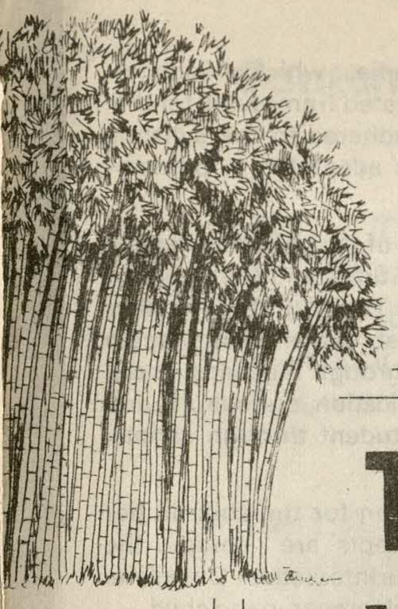
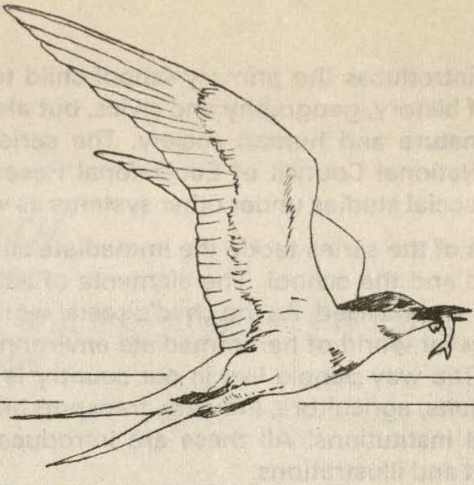
The Way We Live

5

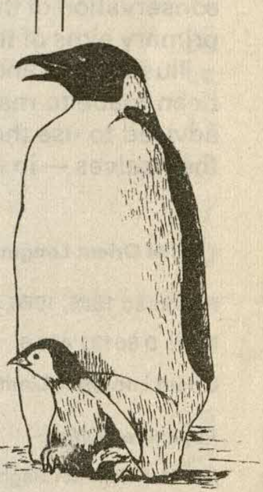
Shrimati Buch
Indira Narayanan

Orient Longman





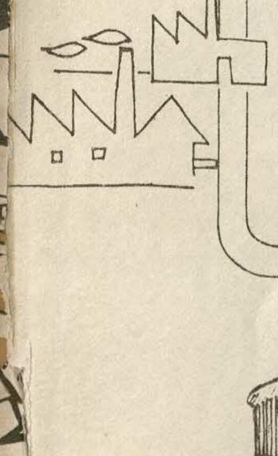
The way we live



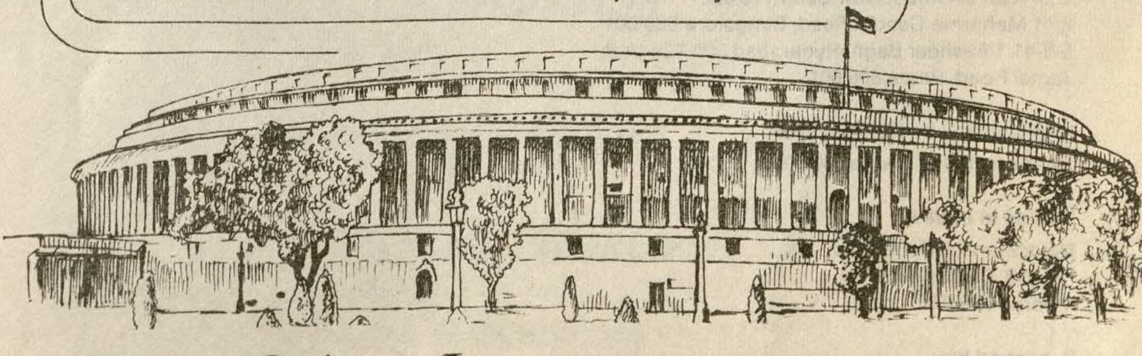
Primary Social Studies

BOOK 5

Shrimati Buch
Indira Narayanan



Illustrations: Vincent Moses Raja
Lalitha
Nithya Balaji



Orient Longman

TO THE TEACHER

The Way We Live introduces the primary-school child to social studies, which means not only the subjects of history, geography and civics, but also an integrated framework for the understanding of nature and human society. The series closely adheres to the syllabus drawn up by the National Council of Educational Research, but is adaptable to primary-school teaching of social studies under other systems as well.

The earlier books of the series tackle the immediate surroundings of the child, her family, the neighbourhood and the school. The elements of each of these units and the need for harmony in each is emphasised. As the child's social world expands, *The Way We Live* takes her beyond the smaller world of her immediate environment to the state, the country and a national heritage. The way people live in our country is explored through lifestyles, social and economic pursuits, agriculture, industry, transport and communication, our culture, and political and social institutions. All these are introduced to the student through simple, comprehensive text and illustrations.

The Way We Live is, as its title suggests, a means of participation for the child in her environment, as she learns about it. The vital, underlying concepts are ecology, the conservation of the natural world and living as a process of continuous interaction. One of the primary aims of the series is to develop attitudes of concern and involvement in the child.

Illustrations and exercises to this end are an integral part of each lesson. Every effort has been made to make the text pleasant and the exercises an enjoyable activity. The teacher is advised to use the opportunities within and beyond the books to get the children to express themselves — in words, in writing and in activity.

© 1984 Orient Longman Limited

Reprinted 1985, 1986, 1987 (twice)
ISBN 0 86131 478 6
Orient Longman Limited

Registered Office:
5-9-41/1 Basheer Bagh, Hyderabad 500 029 (A.P.), INDIA

Other Offices:
Kamani Marg, Ballard Estate, Bombay 400 038
17 Chittaranjan Avenue, Calcutta 700 072
160 Anna Salai, Madras 600 002
1/24 Asaf Ali Road, New Delhi 110 002
80/1 Mahatma Gandhi Road, Bangalore 560 001
5-9-41/1 Basheer Bagh, Hyderabad 500 029 (A.P.)
Jamal Road, Patna 800 001

Phototypeset by Klein & Peyerl
135 Anna Salai, Madras 600 002

Printed in India by
Navabharat Offet Works
No 136, Peter's Road
Madras 600 014

Published by:
Orient Longman Limited
160 Anna Salai, Madras 600 002

Acc No – 15343

Contents

UNIT I THE EARTH

1. The earth in space 1
2. The size, shape and movement of the earth 5
3. Major land forms 11
4. Locating places 17

UNIT II THE CLIMATIC REGIONS

5. Heat zones and climatic regions 22
6. The equatorial regions 26
7. The hot deserts 35
8. The cold deserts 45
9. The coniferous forests 53
10. The temperate grasslands 61
11. Life on mountains 70

UNIT III HOW WE GOVERN OURSELVES

12. Our constitution 78
13. Legislature, executive and judiciary 83
14. Rights and duties 89

UNIT IV WORLD COOPERATION

15. The United Nations 93
16. U.N. agencies 98
17. Other international organisations 103

UNIT V THE CHANGING WORLD

18. Speech and writing 108
19. The development of technology 115
20. Buying and selling 120

UNIT VI THE PATHFINDERS

21. Philosophers and scientists 126
22. Inventors 137
23. Voyagers 147

UNIT VII TOWARDS HUMAN EQUALITY

24. Fighters against oppression 157
25. The struggle against apartheid 169

1. The earth in space

When you look at the sky at night, you see vast distances in which there are many bright stars. The vast distances around us form what is called space. In space, we have millions of stars which we cannot count. Of all these stars, the one which is most important to us is the sun.

The sun is a very small star. It seems like a large star to us because the sun is the star nearest to the earth, and all other stars are far away. The sun is a million times the size of the earth.

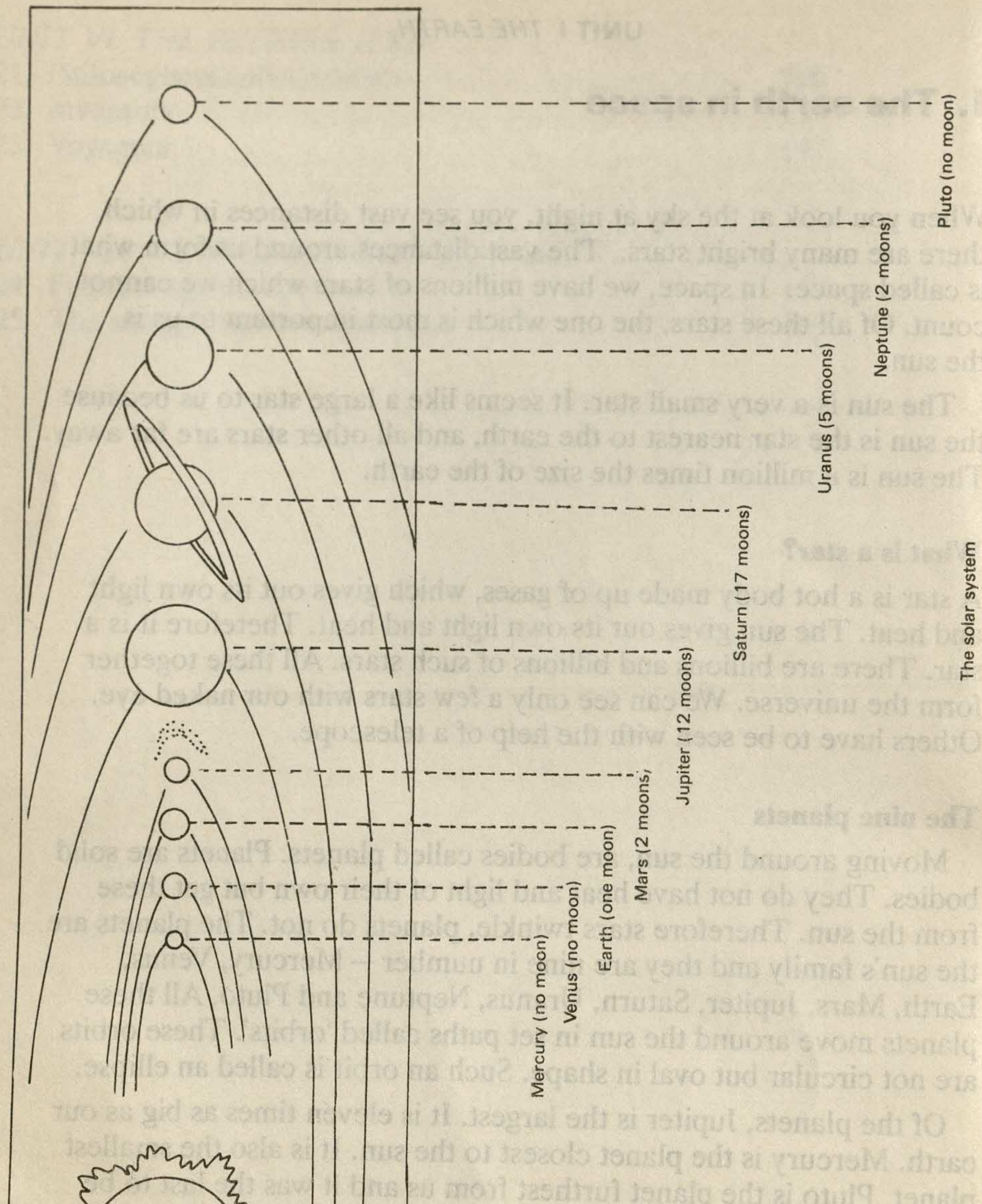
What is a star?

A star is a hot body made up of gases, which gives out its own light and heat. The sun gives out its own light and heat. Therefore it is a star. There are billions and billions of such stars. All these together form the universe. We can see only a few stars with our naked eye. Others have to be seen with the help of a telescope.

The nine planets

Moving around the sun, are bodies called planets. Planets are solid bodies. They do not have heat and light of their own but get these from the sun. Therefore stars twinkle, planets do not. The planets are the sun's family and they are nine in number – Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune and Pluto. All these planets move around the sun in set paths called 'orbits'. These orbits are not circular but oval in shape. Such an orbit is called an ellipse.

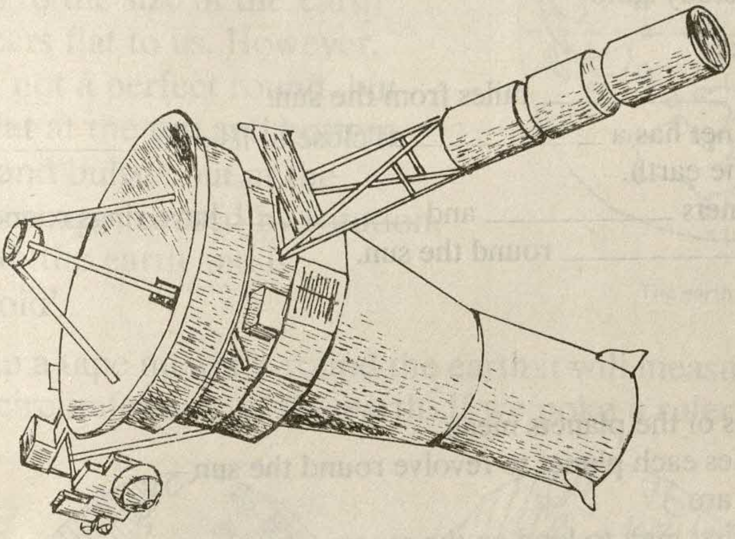
Of the planets, Jupiter is the largest. It is eleven times as big as our earth. Mercury is the planet closest to the sun. It is also the smallest planet. Pluto is the planet furthest from us and it was the last to be discovered. Mercury, Venus, Earth, Mars and Pluto have solid surfaces while the other four planets have gaseous surfaces. Both Saturn and Uranus have rings around them.



The solar system

The solar system

Some of these planets also have other bodies revolving around them. These bodies which move around the planets are called satellites or moons. The earth has only one such moon.
No other planet has a moon so close to its own size. The smaller planets like Pluto, Mercury and Venus do not have any satellites. Mars has two moons, and Jupiter has twelve, while it has recently been discovered by Voyager 2 that Saturn has 17 moons. The sun, all the planets with their satellites, and other heavenly bodies which move round the sun in their set paths, make up the solar system. Among all these planets is our planet earth. Its average distance from the sun is 41,390,000 km (93 million miles). This is the distance suitable to support life on earth.



The Voyager spacecraft

We must remember that the sun is only one star and that the solar system is the family of that one star. In the universe there are billions of such stars. We do not yet know if other stars also have their own families.

Exercises

1. Define:
    a. solar system; b. satellite; c. planet; d. universe; e. star
2. Give reasons why:
    a. Stars twinkle, planets do not.
    b. The sun does not look like other stars.
    c. The sun is called a star.
3. Name the following:
    a. the nine planets
    b. heavenly bodies moving round planets
    c. the smallest planet
    d. the largest planet
    e. the planet furthest away from the sun
    f. the vast distances around us
    g. the path of a planet around the sun
    h. the planet with the largest number of moons
    i. people who study stars
4. Fill in the blanks:
    a. The earth is ____________ miles from the sun.
    b. No other planet has a ____________ as close to its own ____________ as the moon is to the earth.
    c. Both the planets ____________ and ____________ have rings round them.
    d. All planets ____________ round the sun.

Project work

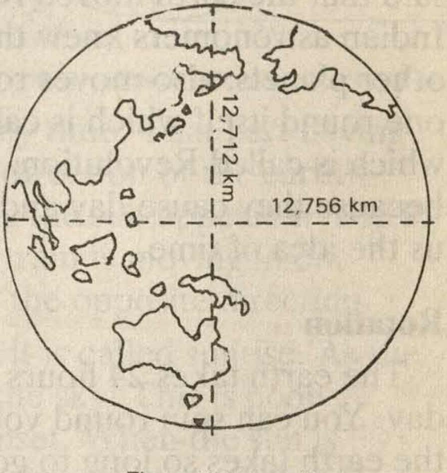
Find out:

1. What the names of the planets mean
2. How long it takes each planet to revolve round the sun
3. What asteroids are
4. Who were the first men to land on the moon
5. How distances are measured in space
6. Who was recently given the Nobel Prize for his study of the stars

2. The size, shape and movement of the earth

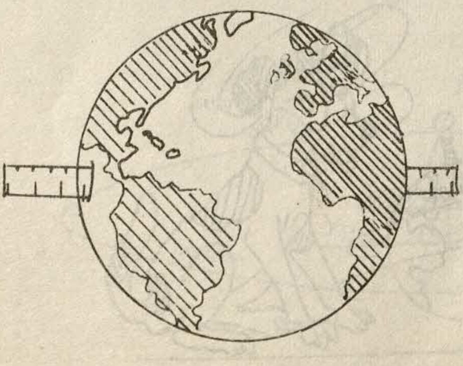
The earth is one of the smaller planets of the solar system. It moves around the sun.

In shape, the earth is round. For a long time people thought that the earth was flat, and were afraid to sail away from the edge of the land for fear they would fall off. Later on they came to realise that the earth must be round. Nowadays, we have pictures taken by astronauts who travel in space, to show us definitely that the earth is round, or a sphere. It is because we are so small in comparison to the size of the earth that it appears flat to us. However, the earth is not a perfect round, but is slightly flat at the top and bottom (the poles) and bulges out at the centre. This shape, caused by rotation, is peculiar to the earth and is called a 'geoid'.

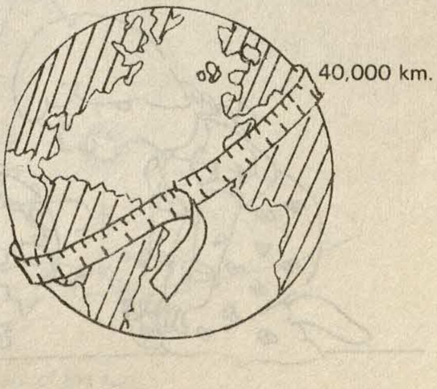


The earth is a geoid.

If we wrap a tape measure round the earth it will measure 40,000 km. This is the circumference of the earth. If we poke a ruler through the



Earth's equatorial diameter



Earth's circumference

earth from north to south, it will measure 12,712 km. This is the earth's polar diameter. If the ruler passes through the middle of the earth in an east-west direction, it will measure 12,756 km. This is the earth's equatorial diameter. There is a difference of 44 km between the two diameters because the earth is flat at the poles.

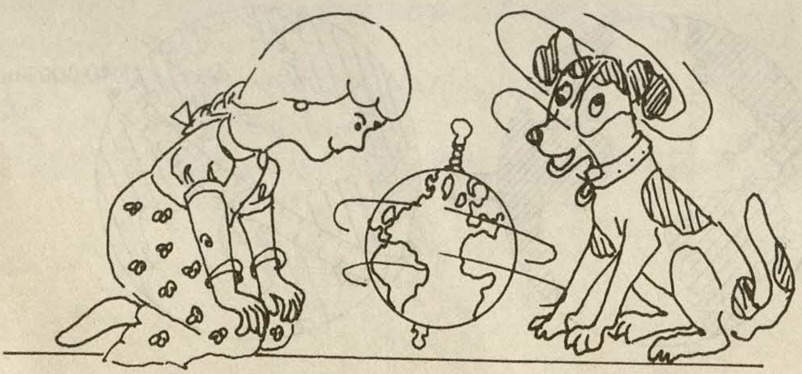
The movement of the earth

As a planet the earth moves round the sun in a definite path called an orbit. For a long time people in the West (Europe) did not know that the earth moved round the sun. They thought that the sun moved round the earth. It was Copernicus, a German astronomer, who first said that the earth moved round the sun and later, Galileo proved it. Indian astronomers knew this long before Copernicus. The earth, like other planets, also moves round itself. Thus it has two movements: one round itself which is called Rotation; the other, round the sun, which is called Revolution. These two movements are very important because they cause day and night and the seasons of the year and give us the idea of time.

Rotation

The earth takes 24 hours to turn round itself once. This is called a day. You can spin round yourself in less than a second. The fact that the earth takes so long to go round itself, even though it goes very fast, shows how big the earth is.

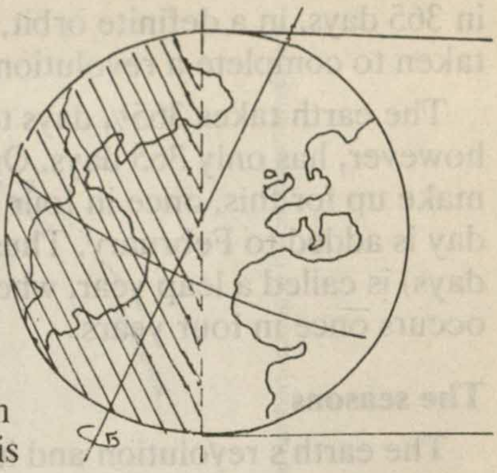
If you have seen a top spinning you will notice that it moves round a nail which passes through its centre. Similarly, if you spin a ball it



The earth spins round its axis like a top.

spins round its centre, though it does not have a visible nail passing through its centre. The imaginary line through the centre, round which the earth spins, is called its 'axis'. The north end of the axis is called the north pole and the south end, the south pole. This axis is not vertical. That is, it does not form 90° with the line of its orbit. It slants away from 90°. The earth's axis is inclined by an angle of 23½° from the line perpendicular to its orbit.

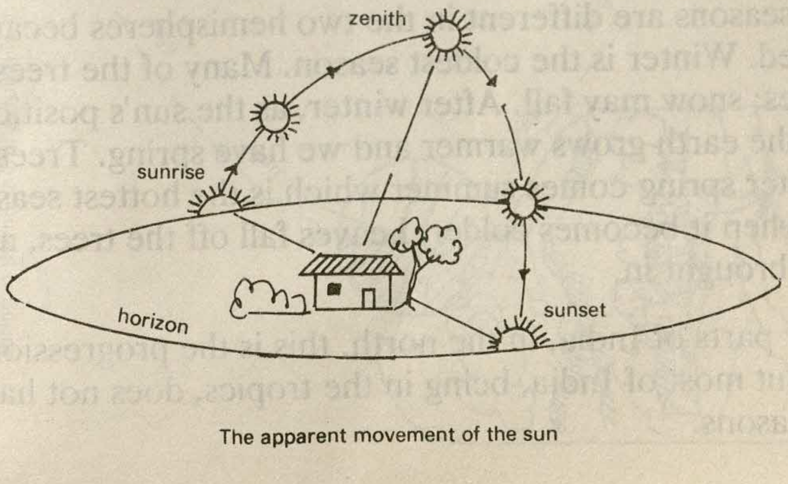
Rotation is the movement of the earth on an inclined axis once in 24 hours. This causes night and day.



The sun lights up half the earth at any time.

The sun lights up only half the earth at any time. That part having light has day, the other part has night. The direction of the earth's rotation is from west to east. Because of this the sun appears to rise in the east and set in the west, just as, when a train is moving in one direction, everything else seems to move in the opposite direction.

When the sun appears above the horizon it is called sunrise. As the earth rotates the sun appears to be high in the sky. This is noon. Later, it sinks below the horizon. This is sunset. When the sun is highest in the sky at noon, it is said to be on its meridian. The highest point in the sky is the zenith.



The apparent movement of the sun

Revolution

The movement of the earth on an inclined axis round the sun, once in 365 days, in a definite orbit, is called revolution. The 365 days taken to complete a revolution is called a year.

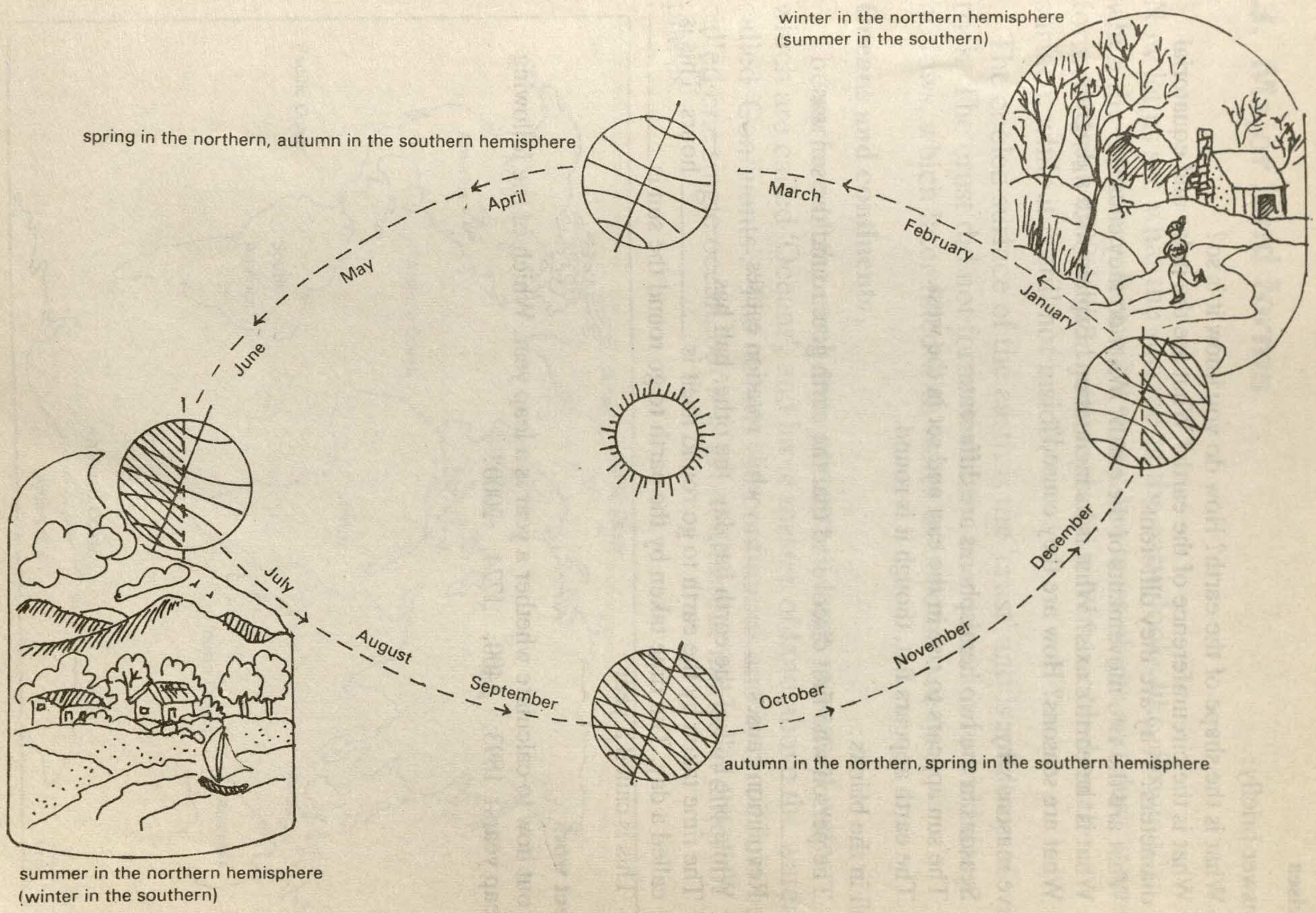
The earth takes 365¼ days to go round the sun once. The calendar, however, has only 365 days. One-fourth of a day is lost every year. To make up for this, once in four years we add a day to the year. This day is added to February. Thus the year which has an extra day (366 days) is called a leap year, when February has 29 days. A leap year occurs once in four years.

The seasons

The earth's revolution and its rotation on an inclined axis cause the seasons. As the earth goes round the sun, and as it is spherical in shape, the position of the earth in relation to the sun changes. Because of this, some parts get more heat and others less. Depending upon the amount of heat received, the year is divided into seasons. Near the poles it is always cold, while near the equator it is always hot, so it is in the areas in between that we have four definite seasons.

There are four main seasons: Spring, Summer, Autumn and Winter. We must remember that the earth's axis is tilted. When the north pole is turned towards the sun, the south pole is turned away. It is then summer in the northern hemisphere and winter in the southern. Six months later, when the earth's position changes, the south pole is turned towards the sun and it is summer in the southern hemisphere. Thus the seasons are different in the two hemispheres because the axis is tilted. Winter is the coldest season. Many of the trees do not have leaves; snow may fall. After winter, as the sun's position changes, the earth grows warmer and we have spring. Trees get new leaves. After spring comes summer which is the hottest season; then autumn, when it becomes colder. Leaves fall off the trees, and the harvest is brought in.

In a few parts of India, in the north, this is the progression of seasons. But most of India, being in the tropics, does not have four definite seasons.


winter in the northern hemisphere
(summer in the southern)
spring in the northern, autumn in the southern hemisphere
March
February
January
April
May
June
December
July
August
September
October
November
autumn in the northern, spring in the southern hemisphere
summer in the northern hemisphere
(winter in the southern)

The earth's revolution and its rotation on an inclined axis cause the seasons.

Exercises

1. Answer briefly:
   - a. What is the shape of the earth? How do you know it is so?
   - b. What is the circumference of the earth? What are the polar and equatorial diameters? Why are they different?
   - c. What are the two movements of the earth? What do they cause?
   - d. What is the earth's axis? What is its inclination? Explain with a diagram.
   - e. What are seasons? How are they caused?
2. Give reasons why:
   - a. Seasons in the two hemispheres are different.
   - b. The sun appears to rise in the east and set in the west.
   - c. The earth appears flat, though it is round.
3. Fill in the blanks:
   - a. The person who first discovered that the earth goes round the sun was ___________ .
   - b. Revolution causes ___________ , while rotation causes ___________ . While one half of the earth has day, the other half has ___________ .
   - c. The time taken by the earth to go round itself is ___________ hours. This is called a day. The time taken by the earth to go round the sun is ___________ . This is called a year.

Project work

Find out how to calculate whether a year is a leap year. Which of the following are leap years: 1893; 1400; 1724; 2000?

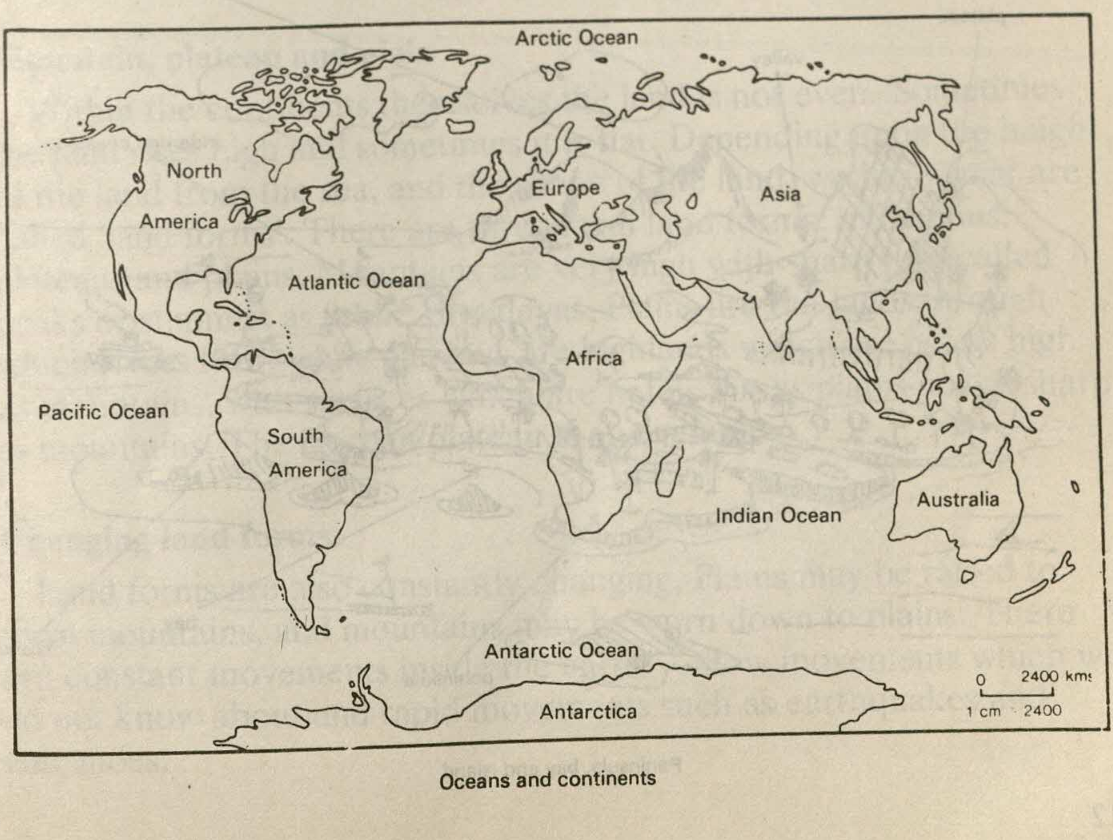
3. Major land forms

Now let us see what the surface of the earth looks like. Originally, when the earth was formed, it was a hot mass of gas and dust. It was formed about 4500 million years ago. Now it has cooled on the surface, while it is still hot inside.

The cooled surface of the earth is the 'crust' and is made up of rock. The crust did not form smoothly. Sometimes it formed deep hollows, which later filled with water to become oceans.

Oceans and continents

The surface of the earth thus consists of large masses of water which are called 'Oceans', and large masses of land above the water called 'Continents'. The oceans are continuous and in fact could be called one single ocean, but it is given different names in different places.



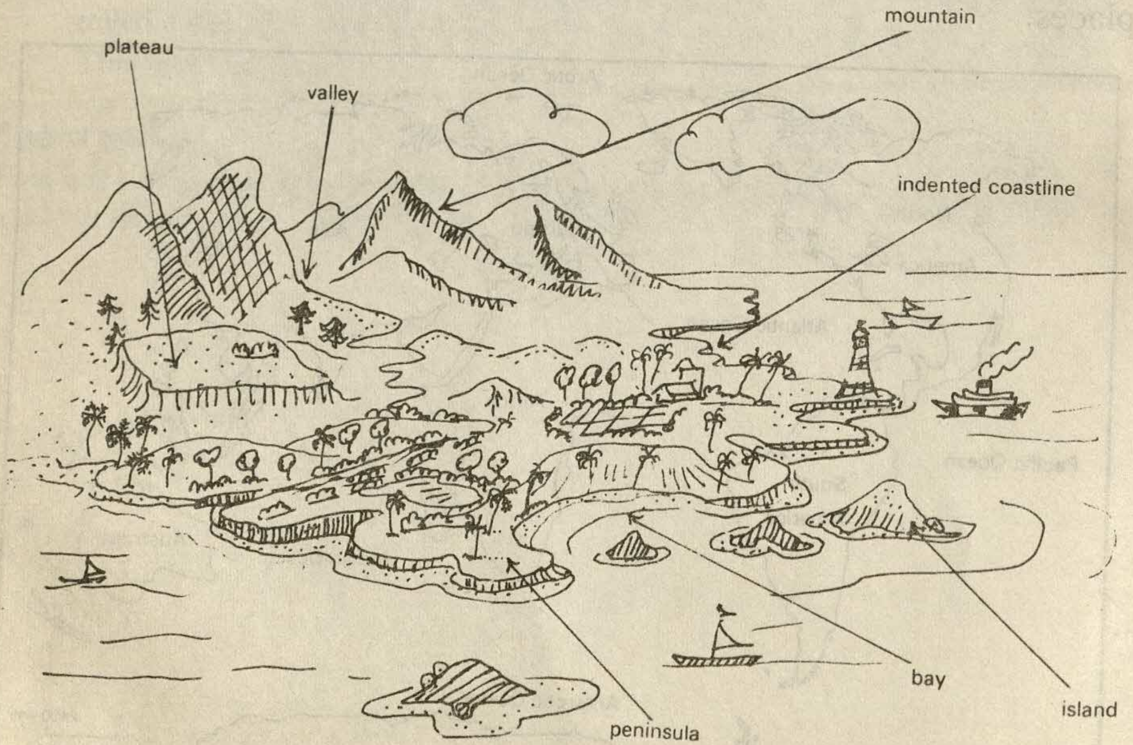
Oceans and continents

The oceans according to size are the Pacific Ocean, the Atlantic Ocean, the Indian Ocean, the Arctic Ocean and the Antarctic or Southern Ocean.

Indeed, 75 per cent of the earth is covered with water and so the earth is called the watery planet. No other planet has water in such a form. The ocean was formed by rain filling the hollows of the crust. It was not salty at first, but has become so by millions of years of continuous evaporation.

The continents according to size are Asia, Africa, North America, South America, Antarctica, Europe and Australia (or Oceania). Asia is the largest continent, while Australia is the smallest.

Asia and Europe are joined together. The continent of Antarctica is completely covered with ice. Formerly, all the continents were joined together to form one large continent, but now they have broken apart.



Peninsula, bay and island

Peninsula, bay and island

The place where land and water meet is called the 'coast'. The coast may be straight or crooked. If the coast is not straight, and there are many parts of the sea going into the land or of land jutting out into the sea, then the coast is said to be indented. Indented coasts provide good harbours.

Near the coast, if the land runs out into the sea and is surrounded on three sides by water, that land is called a peninsula. The tip of the peninsula is a cape. South India and Kanyakumari (Cape Comorin) are examples of a peninsula and a cape.

When the sea runs into the land and is surrounded on three sides by land, it is called a bay. The Bay of Bengal is an example of this.

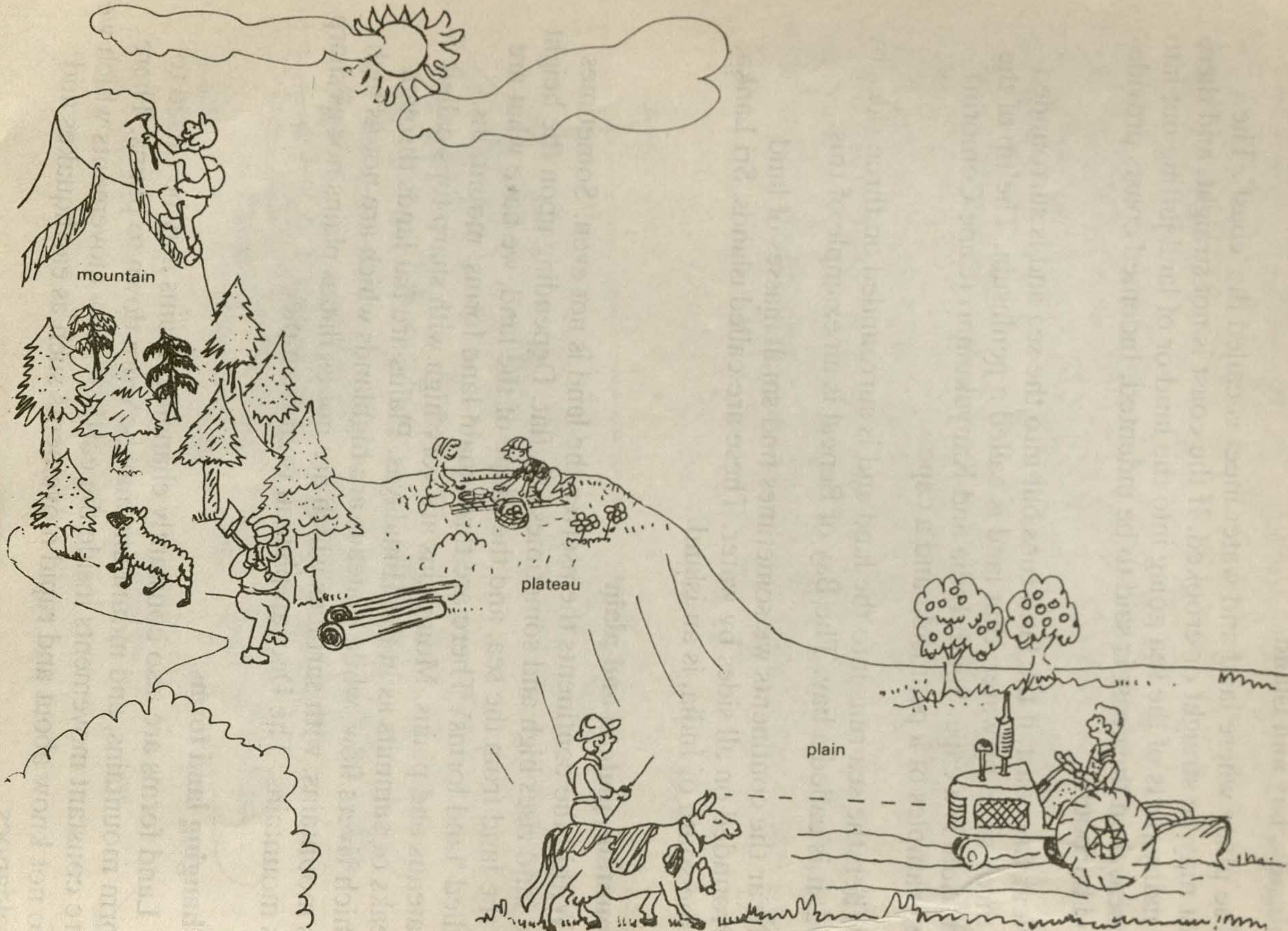
Near the continents we sometimes find small masses of land surrounded on all sides by water. These are called islands. Sri Lanka, to the south of India, is an island.

Mountain, plateau and plain

Within the continents themselves the land is not even. Sometimes the land rises high and sometimes it is flat. Depending upon the height of the land from the sea, and the shape of the land, we have what are called 'land forms'. There are three main land forms: mountains, plateaus and plains. Mountains are very high with sharp tops called peaks or summits as in the Himalayas. Plains are flat lands through which rivers flow, while plateaus are highlands which are not as high as mountains, with surfaces which are not as flat as plains nor as sharp as mountains. The Deccan plateau is an example.

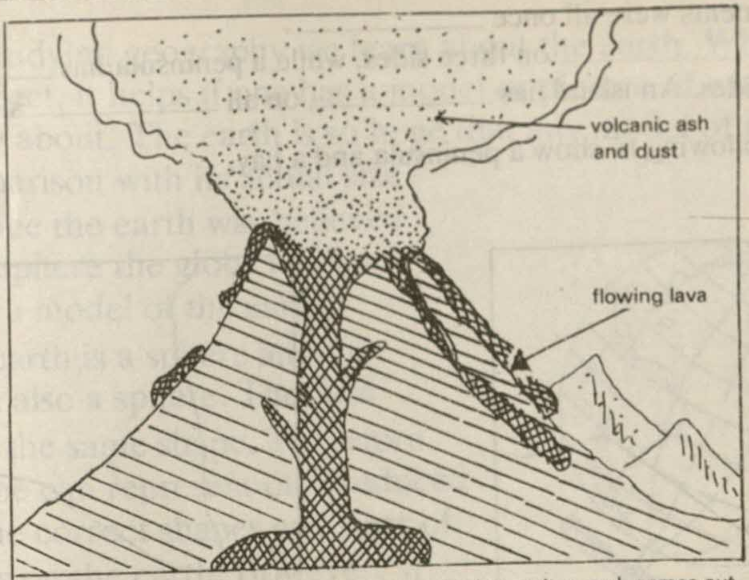
Changing land forms

Land forms are also constantly changing. Plains may be raised to form mountains, and mountains may be worn down to plains. There are constant movements inside the earth — slow movements which we do not know about and rapid movements such as earthquakes and volcanoes.



Major land forms

Earthquakes are the trembling of the earth due to some disturbances in the crust, while volcanoes are holes in the crust through which hot molten rock comes out.



Volcanoes are holes in the crust through which hot molten rock comes out.

Thus you see that the earth's surface is never the same, though it takes a long time to change.

Exercises

1. Answer briefly:
   a. Name the continents and oceans according to size.
   b. How were the oceans formed?
   c. What is a coast? What do you mean by an indented coastline?
   d. With diagrams and examples define island, peninsula and bay.
2. What are the major land forms? Define and give examples. Draw them.
3. Give reasons why:
   a. The oceans are salty.
   b. The earth is called a watery planet.
4. Fill in the blanks:
   a. About ____________ per cent of the earth is covered with water.
   b. ____________ is the continent completely covered with ice.

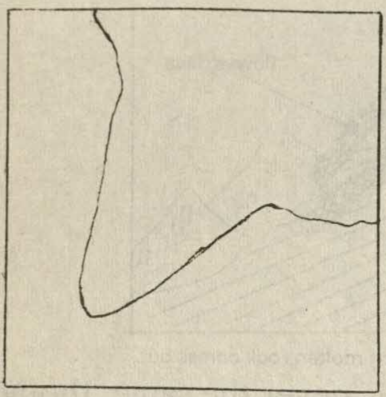
c. The trembling of the earth is called an __________. A volcano is __________.

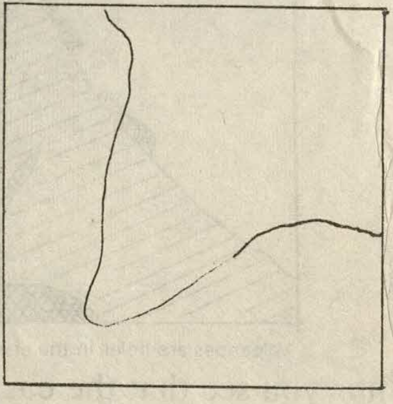
d. __________ is the largest island in the world.

e. The continents were all once __________.

f. A bay has __________ on three sides, while a peninsula has __________ on three sides. An island has __________ on all __________ sides.

5. Colour the following to show a peninsula and a bay.





Project work

1. From an atlas pick out the names of some important mountains and plateaus and some islands and peninsulas. Also find out which continents are bordered by which oceans.
2. Find out which are a. the highest peak in the world; b. the highest plateau; c. the deepest part of the ocean.
3. On an outline map of the world name the continents and oceans.
4. Make a clay or papier-mache model of mountains, plateaus, plains, bays, peninsulas and islands.

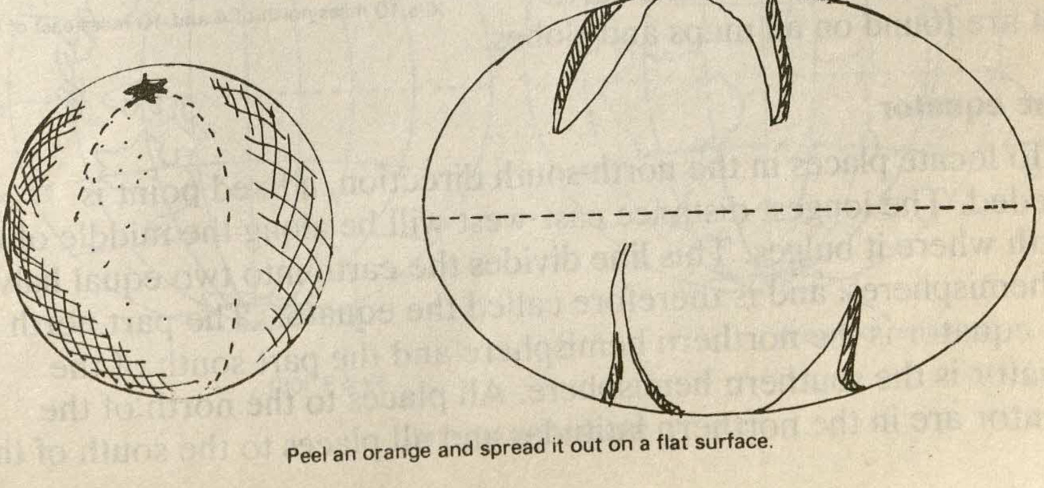
4. Locating places

While studying geography we learn about the earth. When studying any subject, it helps if one has a model or picture of what one is learning about. The earth is so huge that any model of it will be small in comparison with its actual size. Ever since the earth was believed to be a sphere the globe has been used as a model of the earth.

A globe

The earth is a sphere and the globe is also a sphere. They are both of the same shape. Therefore the globe can represent on a reduced scale the correct shapes and sizes of all areas on the earth. However, if we need to get a detailed idea of a place, a globe would be very inconvenient to use since a very large globe would be needed.

Instead, maps and charts are used. A map represents the world on a flat surface. It can show the whole world or a section of it depending upon the size chosen. However it has one disadvantage. Maps cannot show all places accurately in terms of area, distance and shape.



Peel an orange and spread it out on a flat surface.

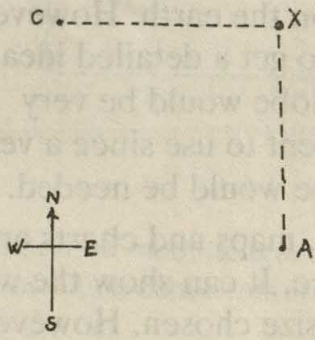
Imagine an orange peel spread out on a flat surface. It will be noticed that the top and bottom of the peel stretch apart and tear. So too with a map. It is difficult to represent a spherical surface on a flat one with mathematical accuracy.

Location of places in maps

It must be remembered that one cannot make a map or globe without mathematically locating all the places. Every area on the ground has to be located accurately. It is only recently that the whole world has been accurately mapped.

To locate a particular house in a town both the number of the house as well as the name of the street have to be known. It is not possible to find the place unless both these facts are known. So also in a map or globe. The distance east or west and the distance north or south from a particular point have to be known. Suppose we say that a point X is 10 miles north of point A and 10 miles east of point C. Then point X will be located at a point where these two lines cut.

To make such locating of places simple, map makers have made use of imaginary lines called latitudes and longitudes. They are not found on the actual surface of the earth but are found on all maps and globes.



X is 10 miles north of A and 10 miles east of C.

The equator

To locate places in the north-south direction, a fixed point is needed. The longest distance east-west will be along the middle of the earth where it bulges. This line divides the earth into two equal halves or hemispheres, and is therefore called the equator. The part north of the equator is the northern hemisphere and the part south of the equator is the southern hemisphere. All places to the north of the equator are in the northern latitudes and all places to the south of the equator are in the southern latitudes. The latitude of the equator is 0° (neither north nor south).

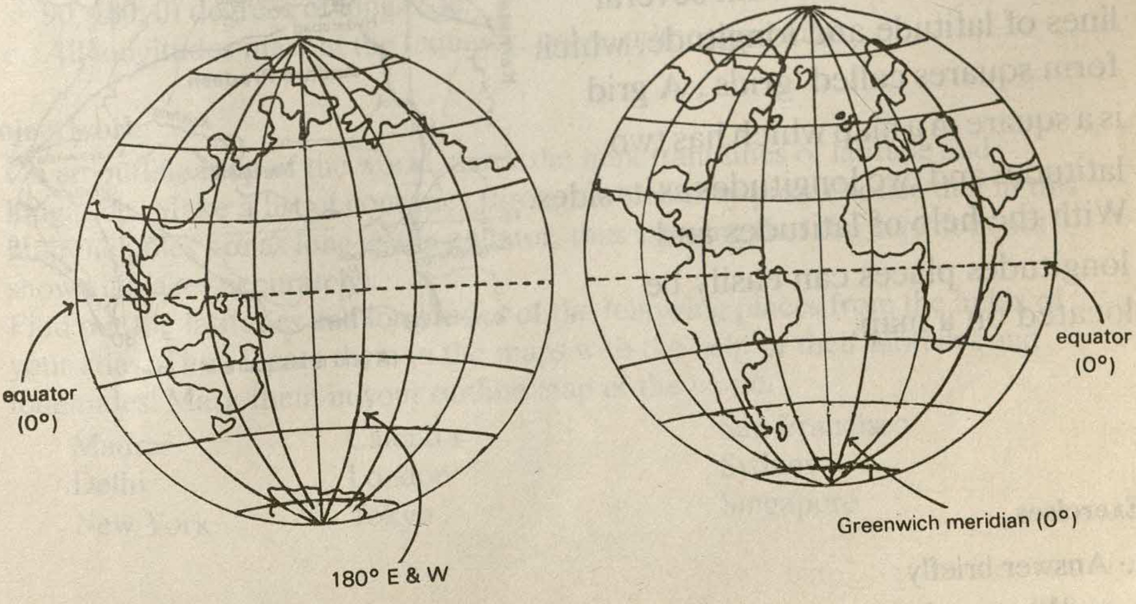
Latitudes

All latitudes are measured from the equator in terms of angles. A line of latitude is an imaginary line which joins all places with the same angular distance north or south of the equator. Latitudes are horizontal lines. They are expressed in degrees and minutes.

There are 90° of latitude to the north of the equator and 90° to the south. Including the equator itself, this makes a total of 181°. All these lines are parallel to one another; therefore, they are also called parallels. The shortest lines of latitude are the north and south poles (which are just points) while the equator is the longest.

Besides the equator and the 2 poles the other important lines of latitude are:

1. The Tropic of Cancer — 23½°N.
2. The Tropic of Capricorn — 23½° S.
3. The Arctic Circle — 66½° N.
4. The Antarctic Circle — 66½° S.



Latitudes and longitudes

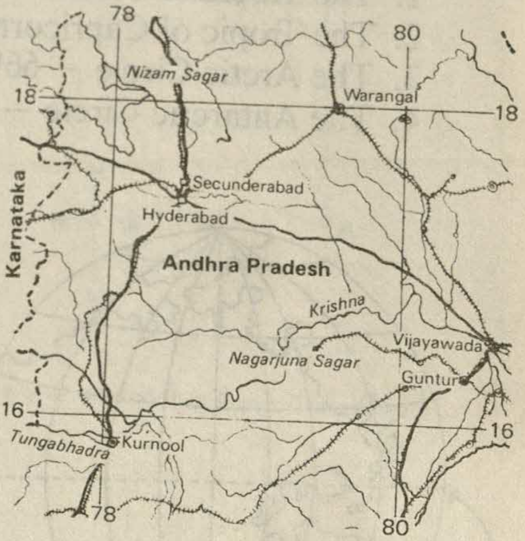
Longitudes

A line of longitude is an imaginary line which joins all places with the same angular distance east or west of the prime meridian. Longitudes pass from pole to pole and cut the equator at right angles. They are vertical lines.

People knew how to find out latitudes, and about the equator, for a long time. But they did not know how to fix longitudes. This is because all lines passing from pole to pole are equal and any one of them can be taken as a fixed point. Finally, it was only in 1894 that it was internationally agreed that the line of longitude which passes through the Royal Astronomical Observatory at Greenwich (England) should be taken as 0° longitude. This is called the 'prime meridian'. It is also called the Greenwich meridian because it passes through the village of Greenwich near London. There are 360° of longitude, half to the east and half to the west of the prime meridian.

The longitudes 180° E and 180°W join together, to form one line of longitude. This is called the 'International Date Line'.

A map is covered with several lines of latitude and longitude, which form squares called 'grids'. A grid is a square in a map which has two latitudes and two longitudes as its sides. With the help of latitudes and longitudes places can easily be located on a map.



A grid is a square in a map.

Exercises

1. Answer briefly:
   a. What are latitudes and longitudes?

   b. What are the important lines of latitude? Draw a circle to represent the globe and mark them.
   c. What are the two important lines of longitude?
   d. What is a grid?
   e. What is a globe?

2. Give reasons why:
   a. It is necessary to have latitudes and longitudes.
   b. It was difficult to fix 0° longitude.
   c. Globes are more accurate than maps.
   d. Globes cannot always be used.

3. Fill in the blanks:
   a. The __________ is the longest line of latitude. All other lines of latitude are __________ than the __________. The __________ are the shortest lines of latitude. They are only __________. Latitudes are also called __________. They are __________ lines.
   b. All longitudes pass from __________ to pole and are __________ in length. Longitudes are __________ lines. The 180° E and 180° W join to form the __________ __________ __________.

4. Pick out the correct word from the brackets:
   a. Latitudes show (angular, linear, actual) distances of places from the equator.
   b. There are (360, 90, 181, 180, 100) degrees of latitude, while there are (360, 90, 180, 0) degrees of longitude.
   c. All longitudes meet at the (equator, poles, prime meridian).

Project work

1. On an outline map of the world, mark the important lines of latitude and longitude. Make a list of countries through which they pass. (Notice that in this map the poles are as long as the equator, thus showing that the map does not show all places accurately).
2. Find out the latitudes and longitudes of the following places from the index of your atlas. Then locate them in the maps with the help of their latitudes and longitudes. Mark them in your outline map of the world.

Madras
Delhi
New York

Calcutta
London
Tokyo

San Francisco
Sydney
Singapore

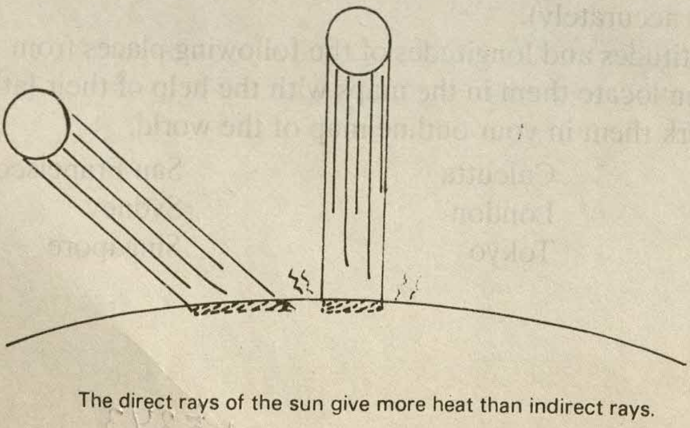
15343

5. Heat zones and climatic regions

The earth is the only planet we know in the whole solar system which has the right surroundings for living things to exist. There is air surrounding the earth with its life-giving oxygen, there is water and there is solid land. The position of the earth in the solar system is also just right for life to exist on it. If the earth were further away from the sun, it would be too cold; if it were nearer to the sun, it would be too hot. That is why the earth is the only planet which has got life on it and it is called the 'living planet'.

Heat zones

We have learnt that the earth is a sphere, and that it has a tilted axis. Because of this the sun's rays strike the earth at different angles. If the sun's rays fall direct or straight, they are able to give more heat; if they fall indirectly or slantingly, they give less heat. Places near the equator receive the direct rays of the sun throughout the year so that it is always hot in these areas, while places near the poles receive only indirect or slanting rays throughout the year, so that it is always cold in the polar regions. In between the equatorial and polar regions are areas which receive direct rays in summer and indirect rays in winter.

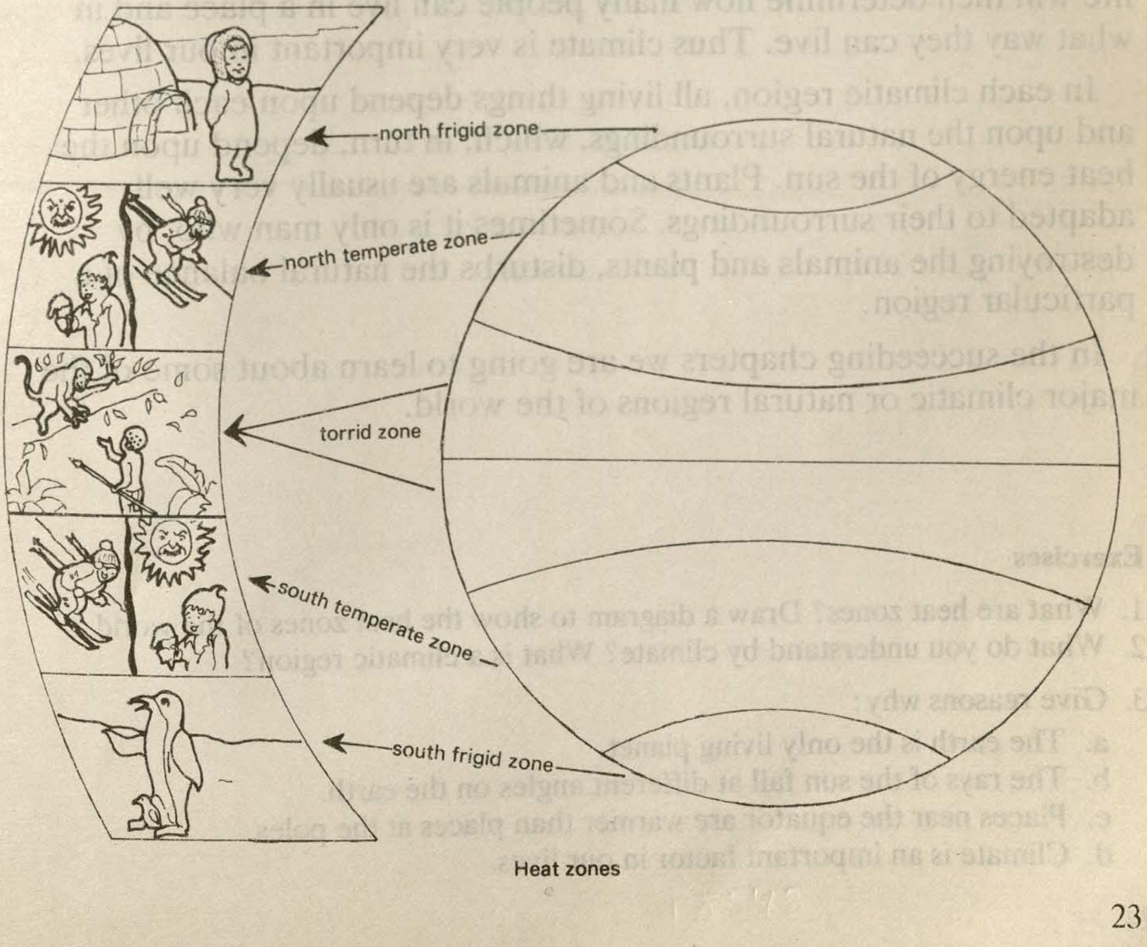


The direct rays of the sun give more heat than indirect rays.

Thus, depending upon the amount of heat received, the earth is divided into heat zones. They are:

1. The torrid zone on either side of the equator upto the tropics of Cancer and Capricorn. It is always hot here.
2. a. The north temperate zone from the tropic of Cancer to the Arctic circle.
   b. The south temperate zone from the tropic of Capicorn to the Antarctic circle.
   Here it is hot in summer and cold in winter.
3. a. The north frigid zone from the Arctic circle to the north pole.
   b. The south frigid zone from the Antarctic circle to the south pole.
   Here it is always cold.

Even within these broad zones some places may be hotter or colder than others — that is, the climate differs from place to place.



Heat zones

What is climate?

Climate refers to the temperature of a place, how hot or cold it is, the length of the summer and winter seasons. It also refers to rain or snow, how much occurs and when.

Based on this there might be two or three climatic regions in each zone. All places in the torrid zone will always be hot but some places will have more rain and others less. Broadly speaking, large areas which have the same amount of rainfall and temperature are grouped together as one 'climatic region'.

The climate of a place depends upon several factors, which you will learn as you grow older.

The temperature and rainfall affect the plants which grow in a particular place and therefore the animals as well, since animals depend on plants for their food. The temperature, animal and plant life will then determine how many people can live in a place and in what way they can live. Thus climate is very important in our lives.

In each climatic region, all living things depend upon each other and upon the natural surroundings, which, in turn, depend upon the heat energy of the sun. Plants and animals are usually very well adapted to their surroundings. Sometimes it is only man who, by destroying the animals and plants, disturbs the natural balance of a particular region.

In the succeeding chapters we are going to learn about some of the major climatic or natural regions of the world.

Exercises

1. What are heat zones? Draw a diagram to show the heat zones of the world.
2. What do you understand by climate? What is a climatic region?
3. Give reasons why:
   a. The earth is the only living planet.
   b. The rays of the sun fall at different angles on the earth.
   c. Places near the equator are warmer than places at the poles.
   d. Climate is an important factor in our lives.

4. Fill in the blanks:

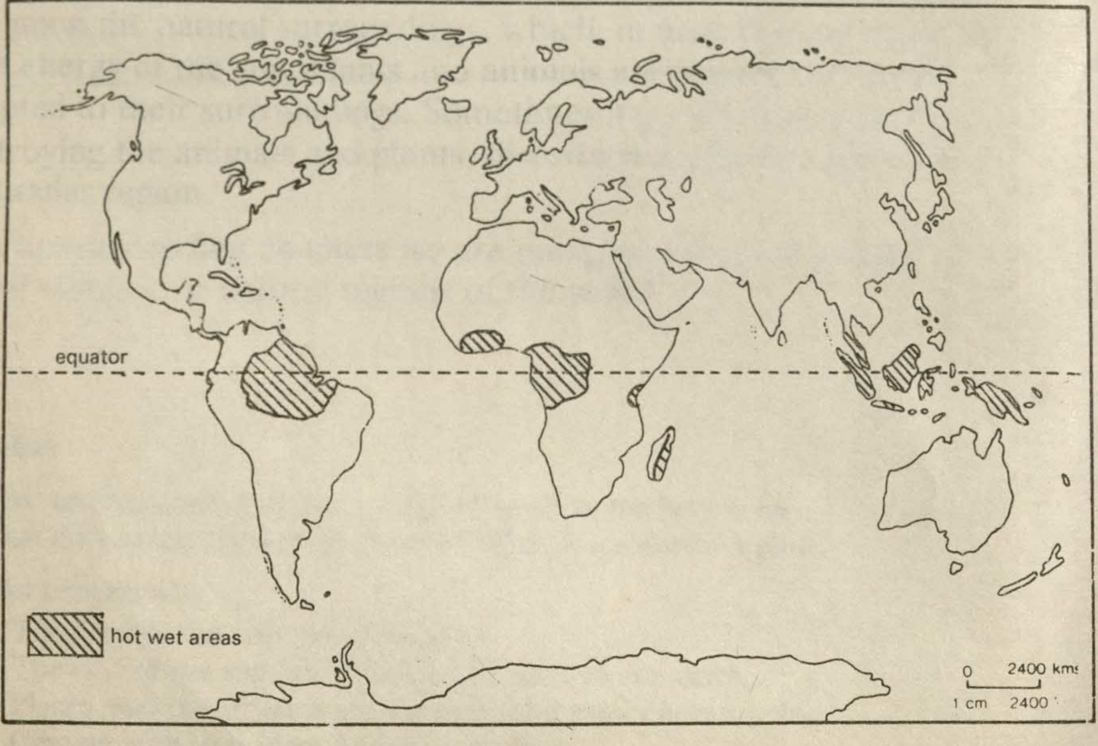
   There are three major __________ zones. The __________ zone is always hot. It lies on either side of the __________, from the tropic of __________ to the tropic of __________. The north temperate zone extends from the tropic of __________ to the __________ circle, and the south temperate zone extends from the tropic of __________ to the __________ circle. Here it is hot in __________ and cold in __________. From the __________ circle to the __________ pole is the north frigid zone. From the Antarctic circle to the __________ pole is the south __________. Here it is always __________.

6. The equatorial regions

You have just learnt that in certain parts of the world it is always hot. These areas are called torrid zones. 5° North and 5° South of the equator are places where it is not only hot throughout the year, but where it also rains throughout the year. These are the equatorial regions. If you look at the map you will find that there are three main areas which have this type of climate. They are:

1. The basin of the great Amazon river in South America.
2. The basin of the River Zaire in Africa.
3. The islands of Malaysia and Indonesia in Asia.

You will notice that the equator passes through all these places. In all three places, the natural surroundings, like the temperature, amount of rain, plants and animals, are almost the same. So they are grouped together as one climatic region.



The equatorial regions

Hot and wet

As these regions are very close to the equator, they are hot throughout the year. Near the equator, the rays of the sun fall almost vertically throughout the year. So the amount of heat received from the sun does not vary and there is no difference between summer and winter. Hence there are no seasons.

The great heat causes a lot of evaporation. Thick dark clouds form every afternoon and heavy thundershowers occur. We can therefore say that the equatorial regions are hot and wet throughout the year. There is so much water that there are many huge rivers. The Amazon is the largest river in the world in terms of volume of water and the second in terms of length. It has many tributaries. Since it rains throughout the year, it is not as hot as it could be in this region. The rains lessen the heat to some extent.

Vegetation

Plants require both warmth and moisture for their growth. There is plenty of both available here all the year round, so plants grow very

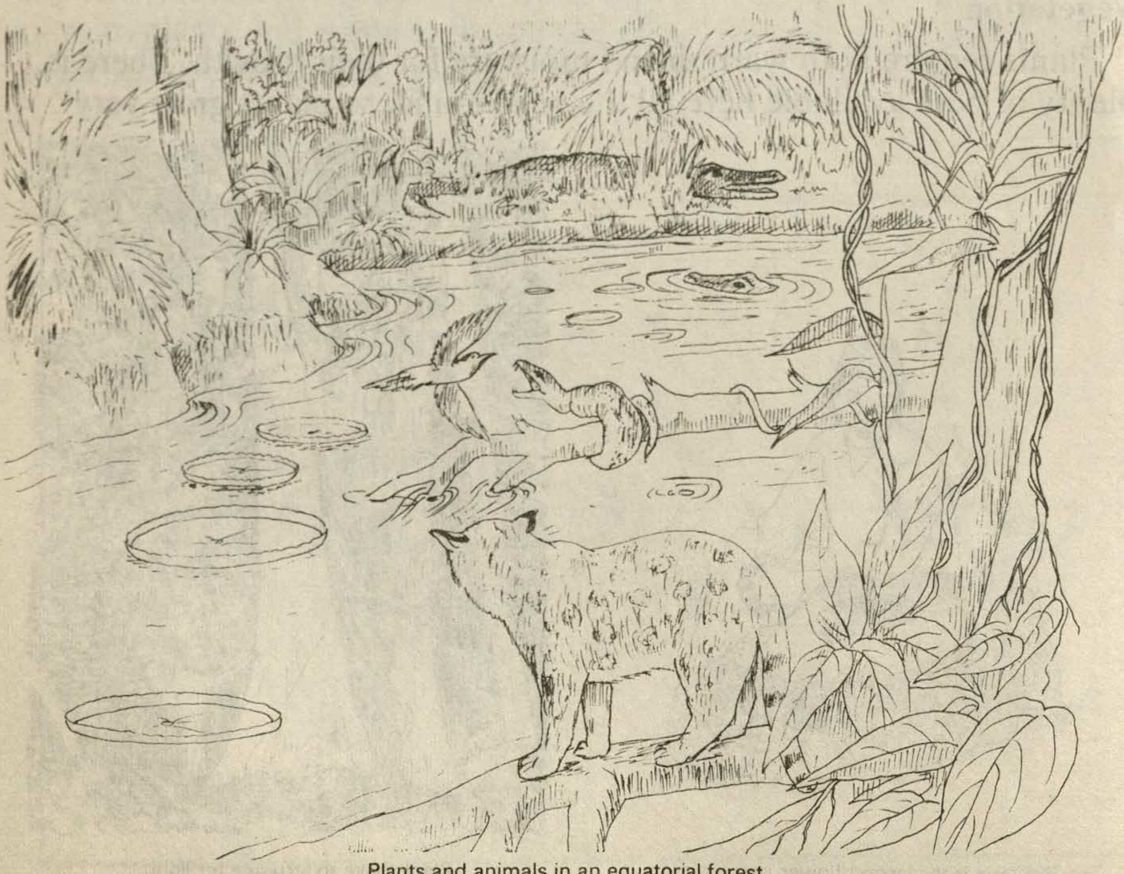
The Rafflesia is the largest flower in the world.

Plants have to struggle for light.

fast indeed. The natural vegetation is a thick jungle of evergreen hardwood trees. The thick forests overflow with plant and animal life. All the plants here have to struggle not for water and heat, but for light. Very little light filters through to the forest floor. There are three layers of vegetation. Very tall trees, then a lower layer, and an undergrowth of ferns and creepers. The creepers, called 'lianas', grow on the branches of trees. These are called 'epiphytes'. The largest flower in the world, the 'Rafflesia', grows in these forests in Indonesia. The rain forests thus are hot, steamy and dark, with a tangle of vegetation, and are called the 'selvas'.

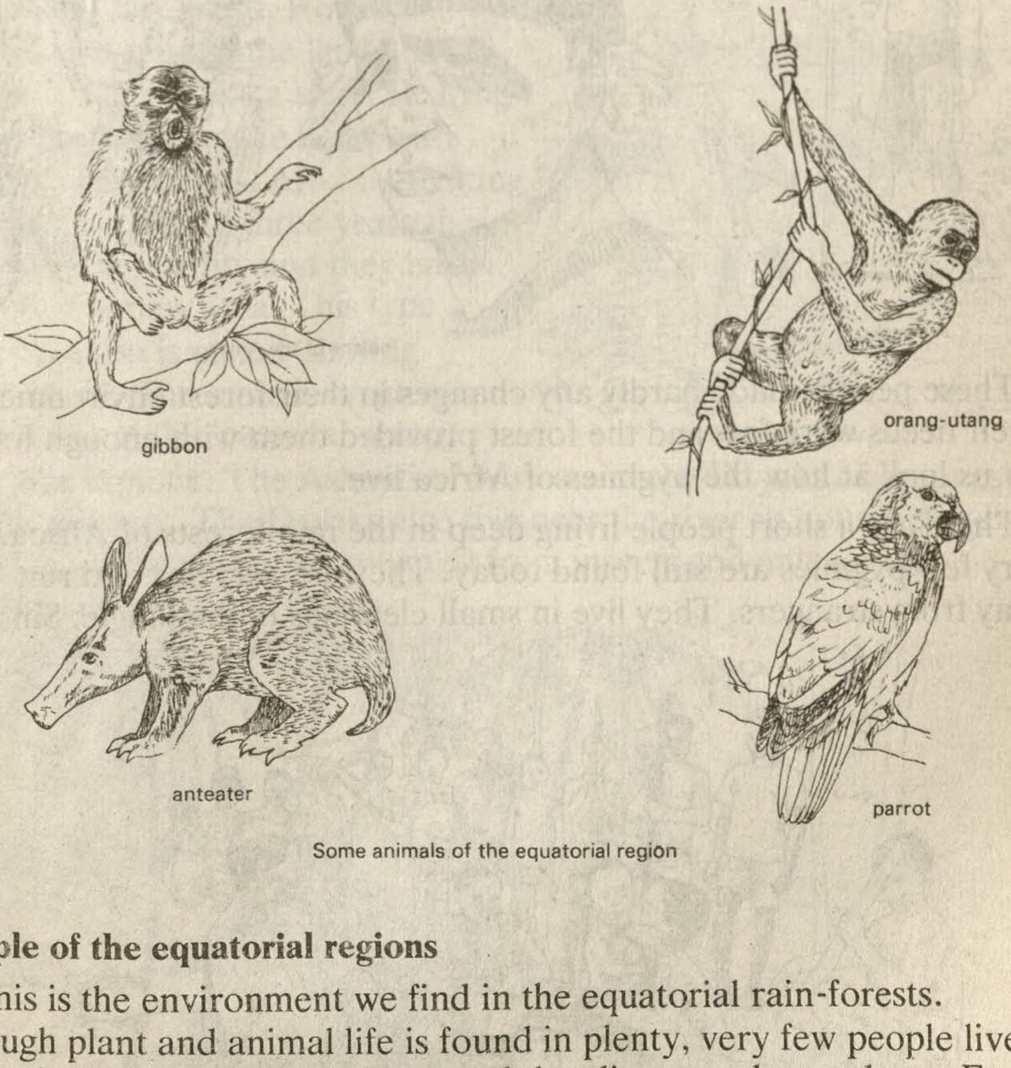
Animal life

In these lush surroundings there is a complex variety of wild life. There are very few large animals like elephants and gorillas, since they find it difficult to move about in the forests. The animals here



Plants and animals in an equatorial forest.

chiefly live in trees, in water, or close to the ground. There are a number of apes and monkeys and sloths, several millions of insects, ants and rodents, beetles and snakes. There are many varieties of fruit-eating birds like parrots and fly-catchers. The rivers are full of many kinds of fish like the piranha and the electric ray. There are so so many ants that the anteaters or armadillos live by feeding on them. The tapir is the largest rodent which roots about in the ground. Since the trees bear a lot of fruit, there are many bats.


gibbon

orang-utang

anteater

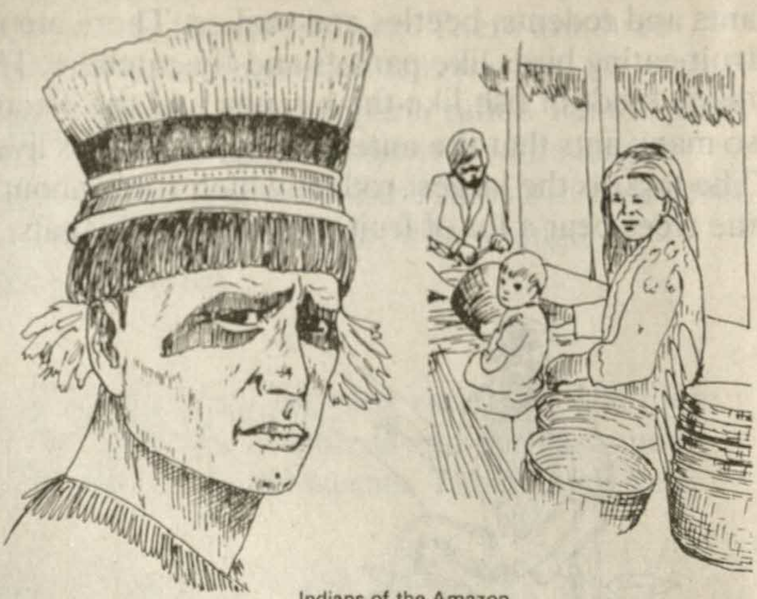
parrot

Some animals of the equatorial region

People of the equatorial regions

This is the environment we find in the equatorial rain-forests. Though plant and animal life is found in plenty, very few people live here, since the forest is so dense and the climate so hot and wet. For a long time the people who did live here were primitive people (at a low level of civilisation), who lived by hunting animals and gathering forest products. Some of them are the pygmies of Africa, the Indians of the Amazon and the Semang, Sakai and Dayaks of Indonesia.

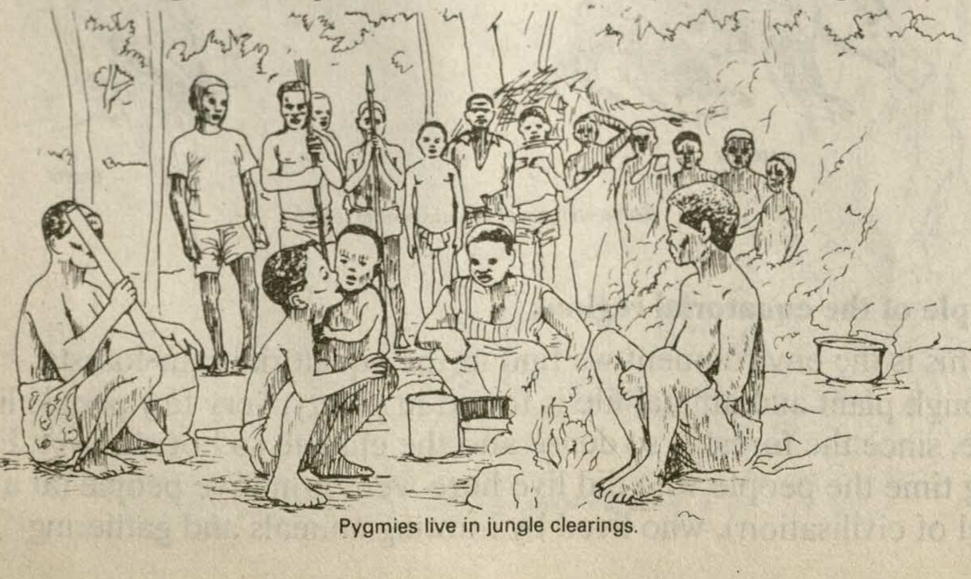
A Dayak



Indians of the Amazon

These people made hardly any changes in their forest environment. Their needs were few and the forest provided them with enough food. Let us look at how the pygmies of Africa live.

These are a short people living deep in the rain forests of Africa. Very few pygmies are still found today. They are very shy and run away from strangers. They live in small clearings in the jungle. Since



Pygmies live in jungle clearings.

it is so hot, they do not need any clothes. Their houses are small and made of branches. They eat fruits, berries and wild honey. They are also clever hunters, and kill animals with poison-tipped arrows. The pygmies wander about in search of food and animals, so they are called nomadic hunters and food gatherers.

Shifting cultivation

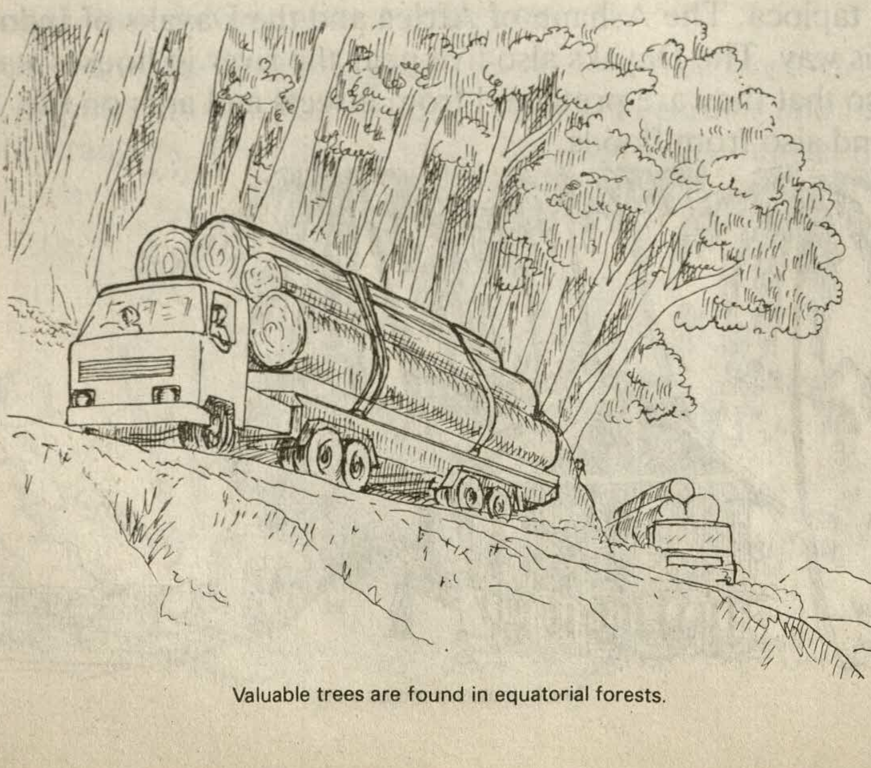
The other people living in similar areas of the world also live in almost the same way. Some of them cultivate a few crops. However they do not plough the land and water it. They make a small clearing in the forest and make holes with sticks to plant seeds. After cultivating the land for two to three years the soil loses its fertility and they have to shift to a new area. This type of cultivation is called 'shifting cultivation'. The main crop grown in this way is the 'cassava', a root crop like tapioca. The Ashanti of Africa and the Dayaks of Indonesia live in this way. The Dayaks also live near the river in houses standing on stilts so that they are protected from insects and ants on the ground and also from floods.

Dayak houses stand on stilts.

Useful products

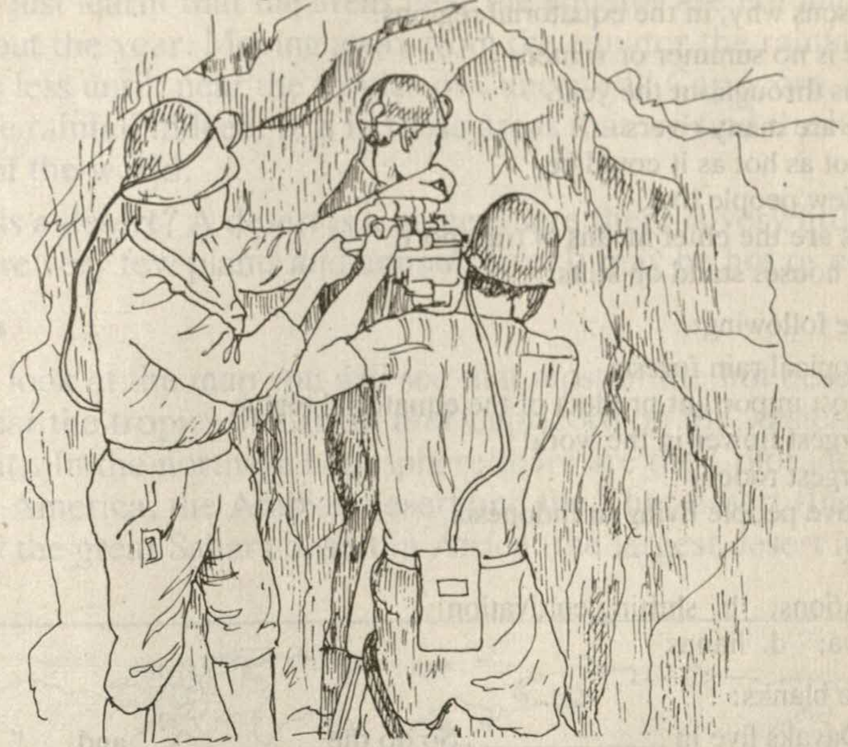
Now people are trying to make use of the equatorial forests. The trees of forests cannot be used fully because it is so dense and the climate so unhealthy. However, many useful products are obtained from these regions. Rubber is the most useful tree grown in these regions. Since the naturally growing rubber trees are scattered in the forest, people have started to grow rubber in 'plantations'. A plantation is an area where trees are planted by man, while a forest grows naturally. Malaysia is the leading producer of rubber in the world. These areas also produce large amounts of palm-oil and cocoa (from which chocolate is made). Mahogany, ebony and rosewood are important trees found in this forest from which furniture is made.

Collecting rubber in Malaysia.



Valuable trees are found in equatorial forests.

Many minerals like copper, iron ore, tin, manganese and uranium are also found. However, it is difficult to transport them to factories as it is difficult to build roads and railways. People use the rivers as the chief means of transport.



Mining in Zaire

Even now very few people live in the tropical rain forests of the world, but these areas are very rich in plant and animal life. Recently, people have been trying to make use of these areas. While doing this we must understand that it has taken nature several thousand years to evolve these rain forests and we do not yet know all the varieties of plants and animals in it. We must not hurriedly destroy what has taken nature so long to produce.

Exercises

1. Answer briefly:
   a. Where are the main equatorial regions of the world?

b. Describe in one sentence what the climate of an equatorial region is like.
c. Who are the pygmies? Where and how do they live?
d. Describe the vegetation in the rain forests.
e. Name some of the different types of animals found in the rain forests.

2. Give reasons why, in the equatorial regions:
   a. There is no summer or winter.
   b. It rains throughout the year.
   c. There are many rivers.
   d. It is not as hot as it could be.
   e. Very few people live.
   f. Rivers are the chief means of transport.
   g. Some houses stand on stilts.

3. Name the following:
   a. the tropical rain forests
   b. the most important product of the equatorial region
   c. the largest flower in the world
   d. the largest rodent
   e. primitive people living in Indonesia

4. What are
   a. plantations; b. shifting cultivation;
   c. cassava; d. lianas

5. Fill in the blanks:
   a. The Dayaks live in ____________ . So do the ____________ and ____________ .
   b. ____________ , ____________ , ____________ , are the most important trees of the rain forests.
   c. ____________ , ____________ , ____________ are some important minerals.
   d. Besides rubber, ____________ , ____________ are important products from trees.

Project work

1. On an outline map of the world, mark the areas having an equatorial climate. Also mark the Amazon river and the Zaire river.
2. Find out more about the life style of the Pygmies.
3. Draw a picture of an equatorial rain forest.
4. Ask your teacher to tell you some stories about the exploration of these rain forests.

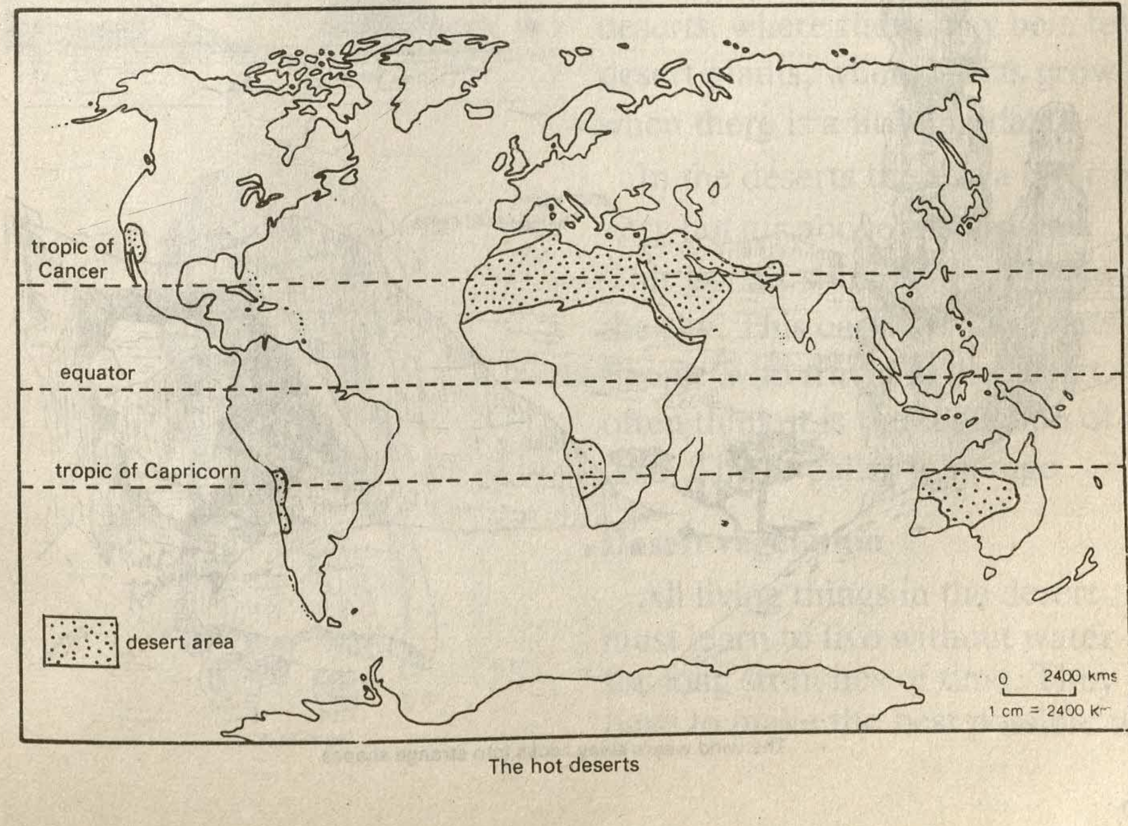
7. The hot deserts

We have just learnt that the areas near the equator are hot and wet throughout the year. Moving away from the equator the rainfall becomes less until, near the tropics of Cancer and Capricorn, there is very little rainfall indeed. It is in these areas that we find the hot deserts of the world.

What is a desert? A desert is a place where there is very little rain and where very few plants and animals live. It may be hot or cold.

Location

If you look at the map you will see that most of the hot deserts are found near the tropics of Cancer and Capricorn on the western side of continents. In the northern hemisphere there are the Colorado desert in North America, the Arabian desert and the Thar desert (India) in Asia and the great Sahara desert in Africa (the largest desert in the world).



The hot deserts

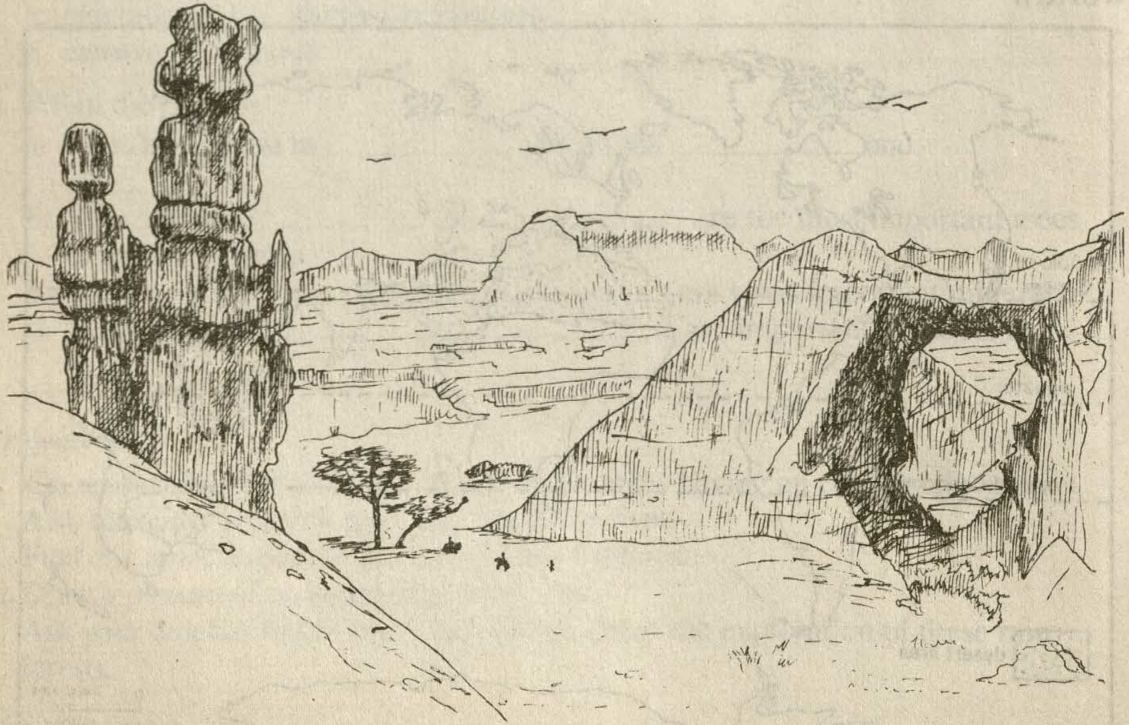
In the southern hemisphere there are the Atacama desert in South America (the driest desert), the Kalahari and Namib deserts in South Africa and the great Australian desert in Australia.

Climate

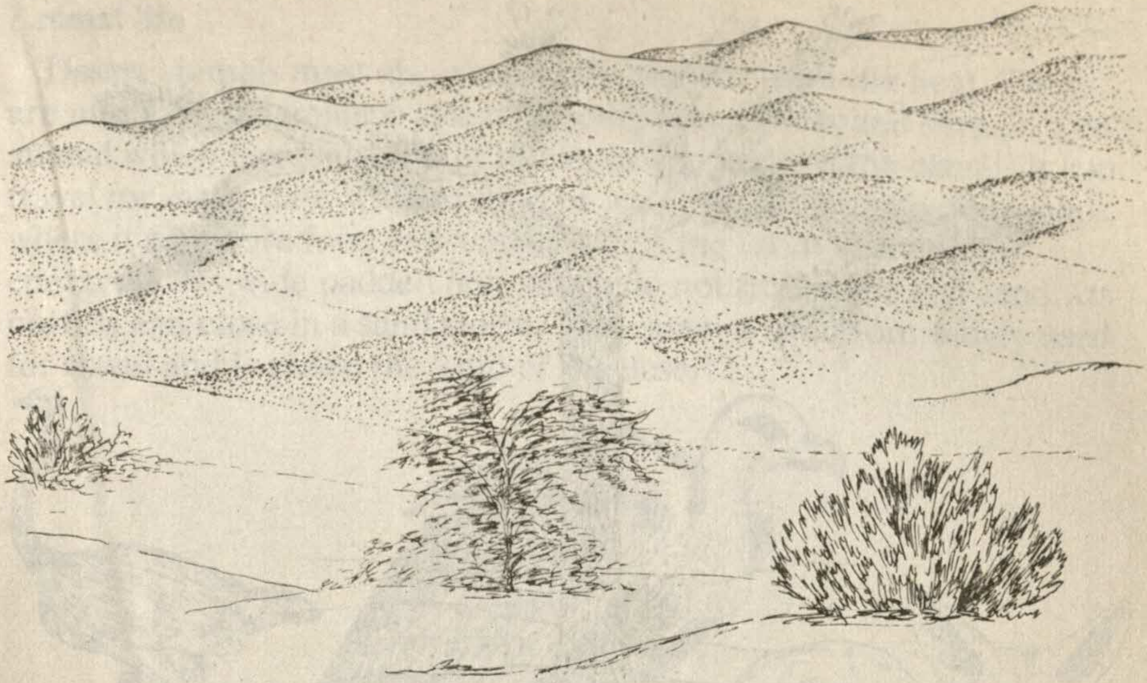
All these deserts are in the torrid zone, so it is very hot throughout the year. The temperatures are high during the day but it becomes cooler during the night. It is very dry. As there are no clouds the heat escapes from the land very quickly. There is very little rain. In certain areas there may be no rain for many years together. Even if rain occurs, it will be in the form of thunderstorms.

The landscape

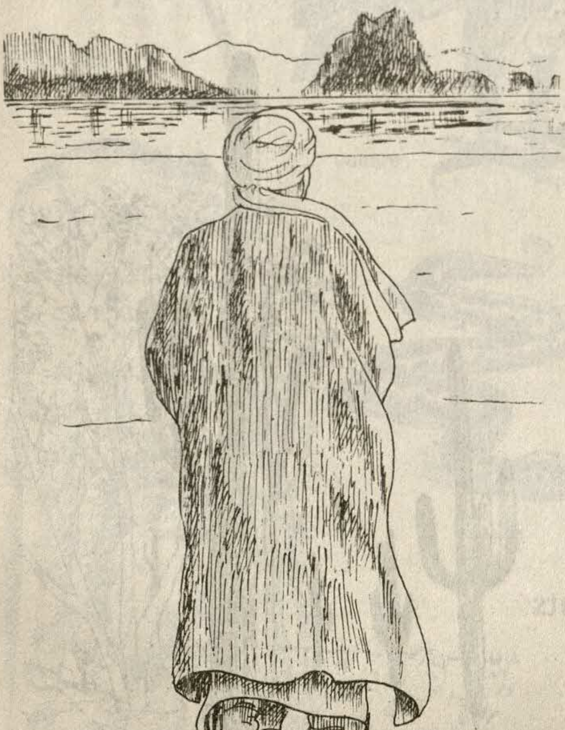
What do these deserts look like? They do not all look alike. They can be of bare rock or covered with sand. If the desert is sandy, the wind can pile the sand into small hills called sand dunes. In rocky deserts, the wind wears away the rocks into strange shapes. Many



The wind wears away rocks into strange shapes.



Sand dunes and scrub



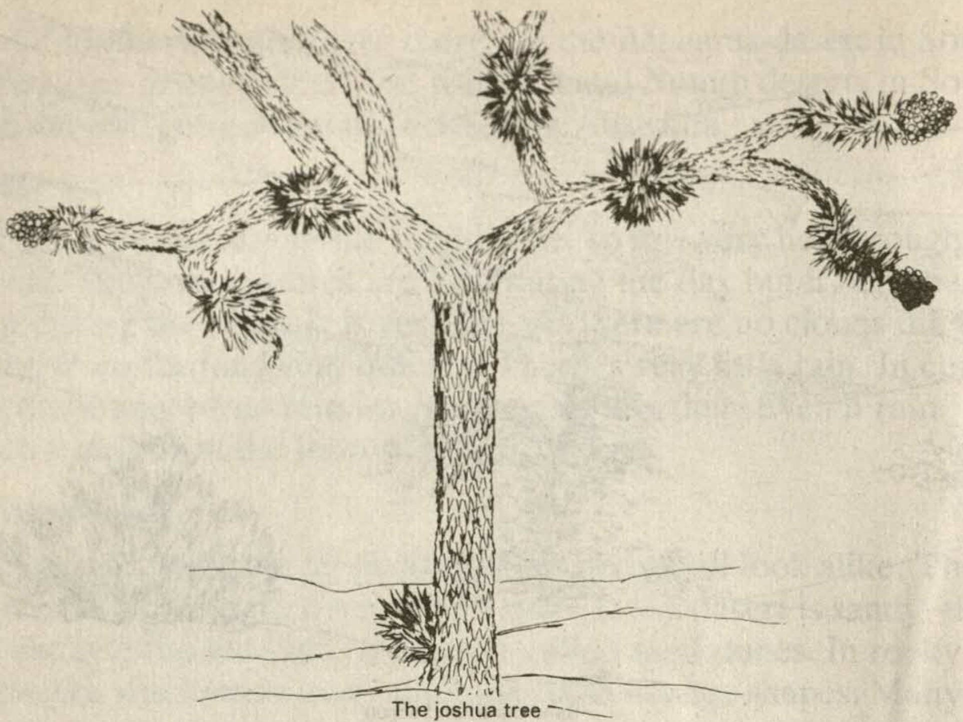
A mirage

deserts are what are called scrub deserts, where there may be a few desert plants, where plants grow when there is a little rainfall.

In the deserts there is a layer of very hot air above the ground. This hot air shimmers and reflects the sky. This can look like water. People who travel in the desert often think it is the reflection of a lake. This is called a 'mirage'.

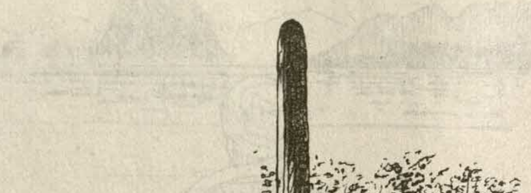
Desert vegetation

All living things in the desert must learn to live without water for long stretches of time. They have to make the best possible use



The joshua tree

of every drop of water. In the desert, we find plants like the joshua tree, varieties of cactus and the thorny sinifex grass. These plants have long roots which spread out, so they can get water from underground. The cactus stores water in its stem. The plants do not have leaves, they have only thorns, since it is through the leaves that plants lose their water. In the scrub deserts, when rain falls hundreds of plants grow. Their seeds have been lying in the desert soil. These plants grow very quickly and have many flowers. When these plants bloom, the desert looks beautiful indeed. They die very quickly, but produce enough seeds which lie in the ground till the next rain comes.



Desert cactus

Animal life

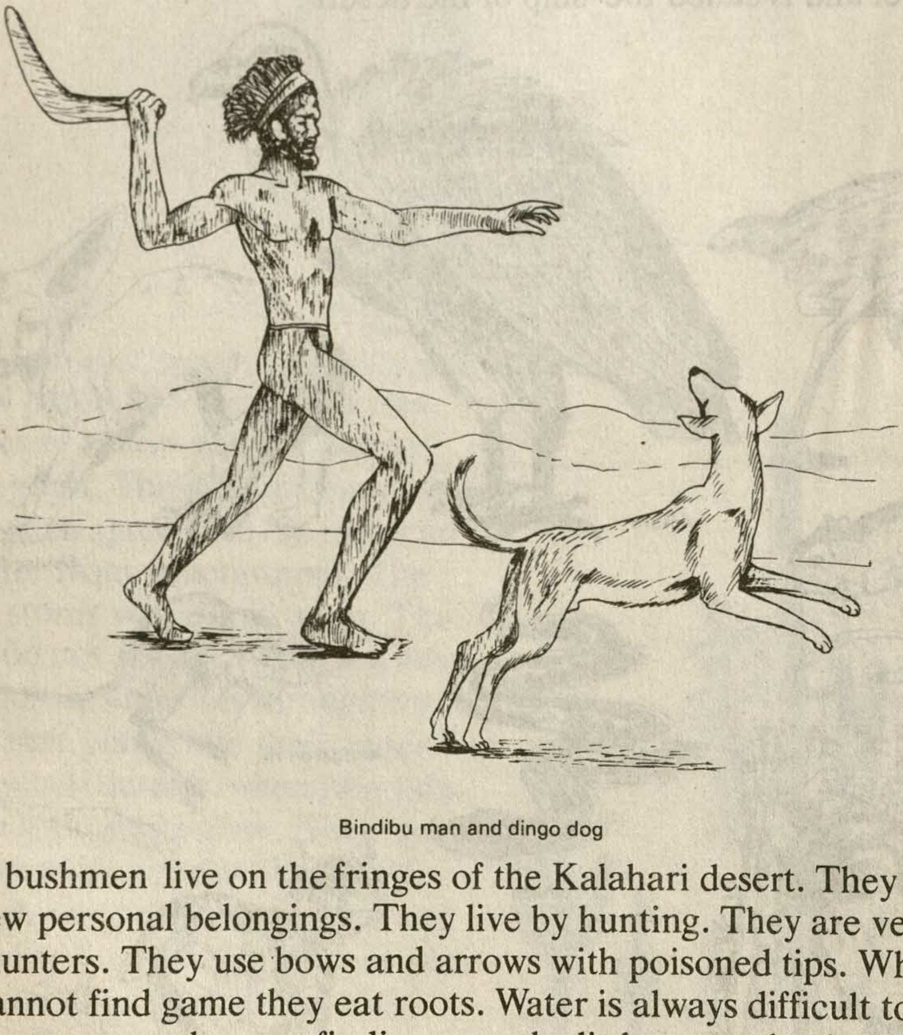
Desert animals must also protect themselves from the heat. They are usually small animals like rats, scorpions, lizards and snakes. The animal which has really learnt to live in the desert is the camel. It can travel for many days without food or water. It has a hump on its back where it can store food and water. It uses the fat in its hump for energy. It has wide padded feet which do not sink in the soft sand. Its nostrils can close in a sand storm. The camel is therefore widely used for travel and is called the 'ship of the desert'.

Desert animals

People of the desert

Many kinds of people live in the deserts of the world. They vary from very primitive people to the most civilised. Many great civilisations have grown and fallen in desert lands.

The simplest way of life in a desert is hunting and gathering. The bushmen of the Kalahari and the Bindibu of Australia live in this way. Since they have to move about in search of food and water, they do not stay in one place for a long time. So they are called 'nomads'.



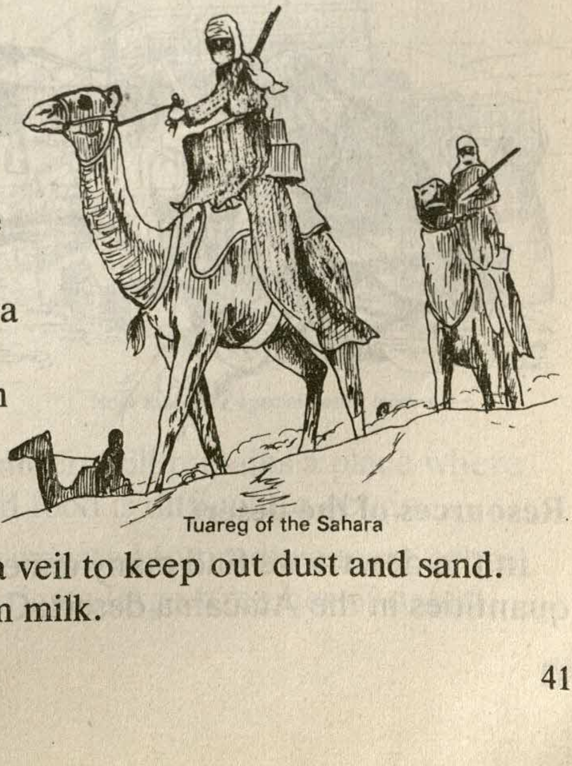
Bindibu man and dingo dog

The bushmen live on the fringes of the Kalahari desert. They have very few personal belongings. They live by hunting. They are very good hunters. They use bows and arrows with poisoned tips. When they cannot find game they eat roots. Water is always difficult to get. But they are very clever at finding even the little water that is available. They do not wear any clothes. Their only shelter is a windbreak made of twigs.

Bushman of the Kalahari

The Hottentots, who also live in parts of the Kalahari, get water by capturing a baboon. Usually a baboon knows where to get water. The Hottentots feed the baboon some salt and keep him thirsty for a long time. When the baboon is released, he makes straight for a water-hole. The Hottentots follow him and are able to drink water from the water hole.

The herders



Tuareg of the Sahara

Some people in the desert live by keeping flocks of sheep, horses, goats and camels. These people are also nomads. The Bedouins of Arabia and the Tuareg of the Sahara are examples. They live in tents made of goats' hair. These tents can be taken down easily. They wear loose-fitting clothes which keep them cool in the day and warm at night. Sometimes the Tuareg wear a veil to keep out dust and sand. They eat meat and foods made from milk.

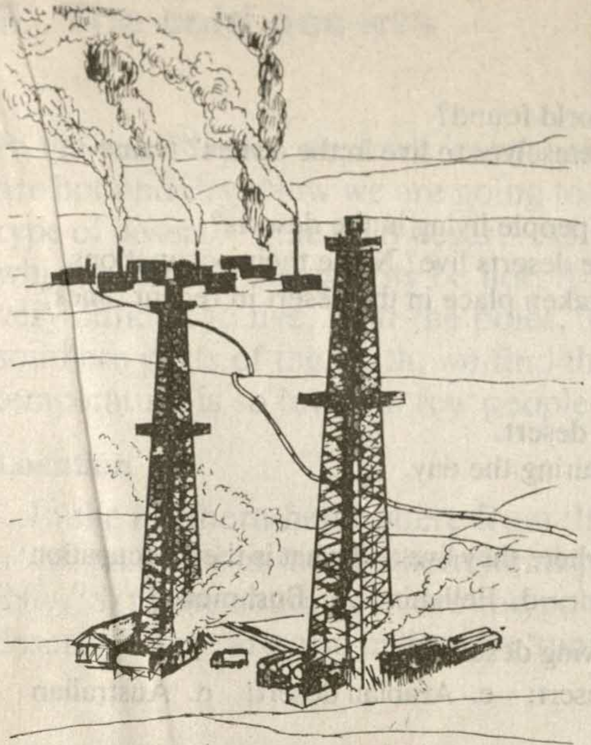
The oases dwellers

An oasis is a fertile area in the desert, where water is available. Here the people grow crops and some date palms are also grown. The River Nile crossing the desert of the Sahara and the River Indus crossing the desert in Pakistan provide valuable water in the desert. In their valleys cotton and wheat are grown. The people who work in the Nile Valley are called Fellahin. In the smaller oases the date palm is very important. It provides the people with a number of things. The date (fruit) is important as food. It can be dried and kept for a long time, without getting spoilt. Even the stones of the date are used to feed camels. The sap of the tree is used to make palm wine. The trunks of the trees are used as fuel and the fibre is used for nets and sacks. The leaves are used for bedding and shelter. The date also provides shelter for other crops in the desert. Most oases are isolated, that is, far away from each other.

An oasis

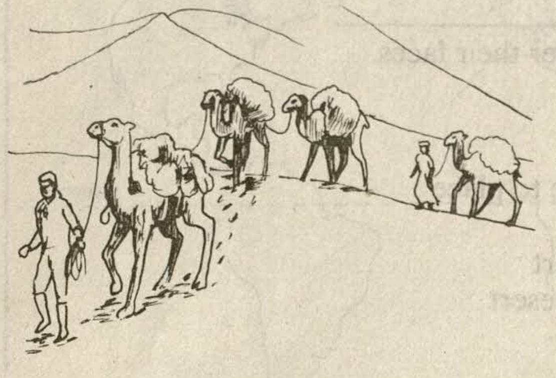
Resources of the desert

In the deserts we find many minerals. Nitrates are found in large quantities in the Atacama desert. Copper is also found there.

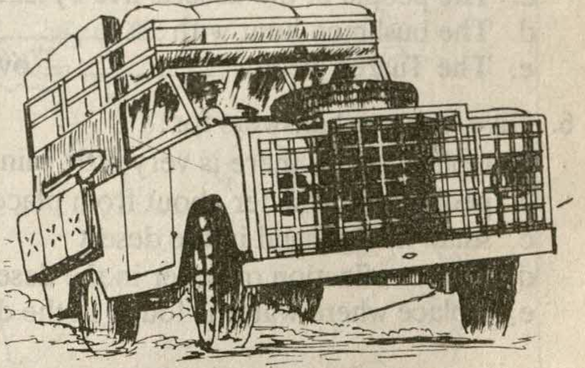


Oil rigs among desert sand dunes

Diamonds are found in the Namib desert. Opal and gold are found in Australia and uranium in America. One of the most important products found in the desert in recent times is petroleum. It is found in large quantities particularly in Arabia and has changed the life of the people. Cities with modern buildings have now come up, in places where there were only a few huts or tents. We can now see oil rigs among the desert sand dunes. Once the way to cross the desert was on a camel. A long chain of slow moving camels called a 'caravan' was used to transport goods. Now we have special land rovers, and aeroplanes. In the desert oases, the inn where travellers stayed, called a 'caravan serai' has been replaced by modern hotels.



Camel trains were the traditional means of travel.



Now there are special desert landrovers.

In spite of all these changes, the desert still remains a place where life is hard, since water is scarce and food is difficult to obtain.

Many desert areas are now being irrigated to produce more crops. The Rajasthan Canal in India will irrigate large stretches of desert.

Exercises

1. Answer briefly:
   a. Where are the hot deserts of the world found?
   b. How have desert plants adapted themselves to live in the desert? Name some of these plants.
   c. How is the date palm important to people living in the deserts?
   d. How do the different peoples of the deserts live? Name their occupations.
   e. What are the changes which have taken place in the desert in recent times? Why have they come about?
2. Give reasons for:
   a. The camel is called the ship of the desert.
   b. Deserts are cold at night and hot during the day.
   c. Very few people live in the desert.
3. Identify the following people and say where they live and what is their occupation:
   a. Bindibu; b. Tuareg; c. Bedouin; d. Fellahin; e. Bushmen.
4. What minerals are found in the following deserts?
   a. American desert; b. Atacama desert; c. Arabian desert; d. Australian desert; e. Namib desert.
5. Fill in the blanks:
   a. Most hot deserts are found near ___________.
   b. Desert plants have long roots because ___________.
   c. The people of the deserts live by ___________ ___________.
   d. The bushmen hunt with ___________ ___________.
   e. The Tuareg wear a ___________ over their faces.
6. Give one word answers for:
   a. a place where there is very little rain
   b. people who wander about from place to place
   c. small hills of sand in the desert
   d. a false reflection of water in the desert
   e. a place where water is found in the desert

Project work

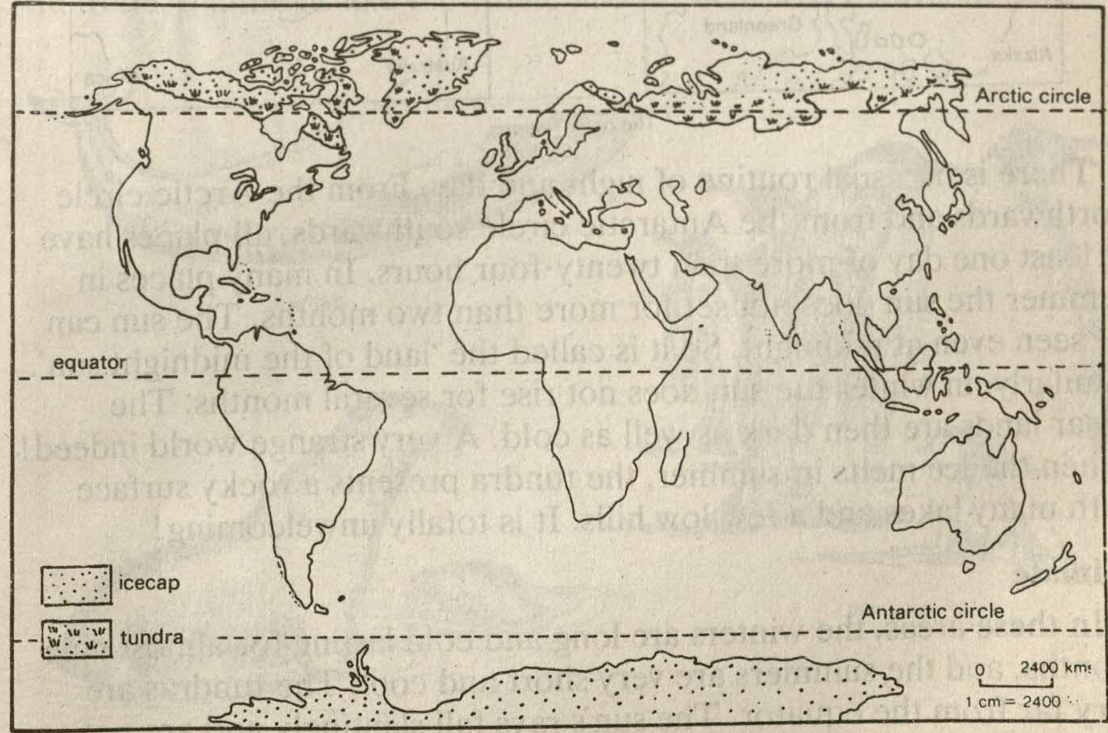
1. On an outline map of the world, mark the tropics of Cancer and Capricorn and the hot deserts. Mark the Nile and the Indus.
2. Find out more about the Bindibu of Australia, the Bedouin of Arabia and the people of the Rajasthan desert.
3. Draw a picture of a desert landscape.

8. The cold deserts

In the last chapter, we have learnt something about the lands which are hot and dry. Now we are going to learn something about the other type of desert — 'the cold desert'. As we said earlier, a desert is a place which need not necessarily be hot. It is a place where people find it very difficult to live. Near the poles, in the extreme northern and southern parts of the earth, we find the cold deserts, where the temperature is so low that few people live and few plants grow.

Location

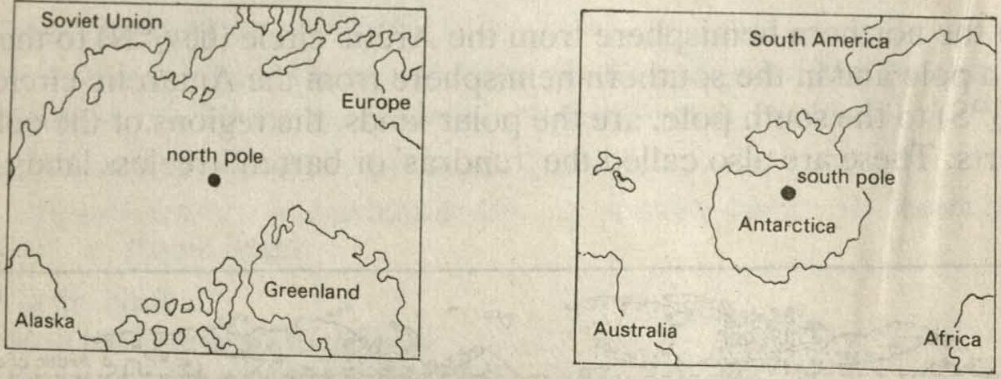
In the northern hemisphere from the Arctic circle (66½°N) to the north pole and in the southern hemisphere from the Antarctic circle (66½°S) to the south pole, are the polar lands, the regions of the cold deserts. These are also called the 'tundras' or barren, treeless lands.



The cold deserts

What the tundras look like

These cold regions are very strange. In two places in this region, in the continent of Antarctica and in the interior of Greenland, the whole land is covered with a thick layer of ice. This is called an 'ice cap'. No land is seen — only this frozen ice which does not melt at all throughout the year. These are the absolute deserts, completely lifeless, where nothing lives. South of this region we have the tundras, where the ice melts for two or three months and the rocky land surface is exposed. These areas include the edges of the continents surrounding the Arctic Ocean, the coasts of Greenland and some parts of Antarctica. These are harsh and silent lands.



The polar regions

There is no usual routine of night and day. From the Arctic circle northwards and from the Antarctic circle southwards, all places have at least one day of more than twenty-four hours. In many places in summer the sun does not set for more than two months. The sun can be seen even at midnight. So it is called the 'land of the midnight sun'. Similarly, in winter the sun does not rise for several months. The polar lands are then dark as well as cold. A very strange world indeed! When the ice melts in summer, the tundra presents a rocky surface with many lakes and a few low hills. It is totally unwelcoming!

Climate

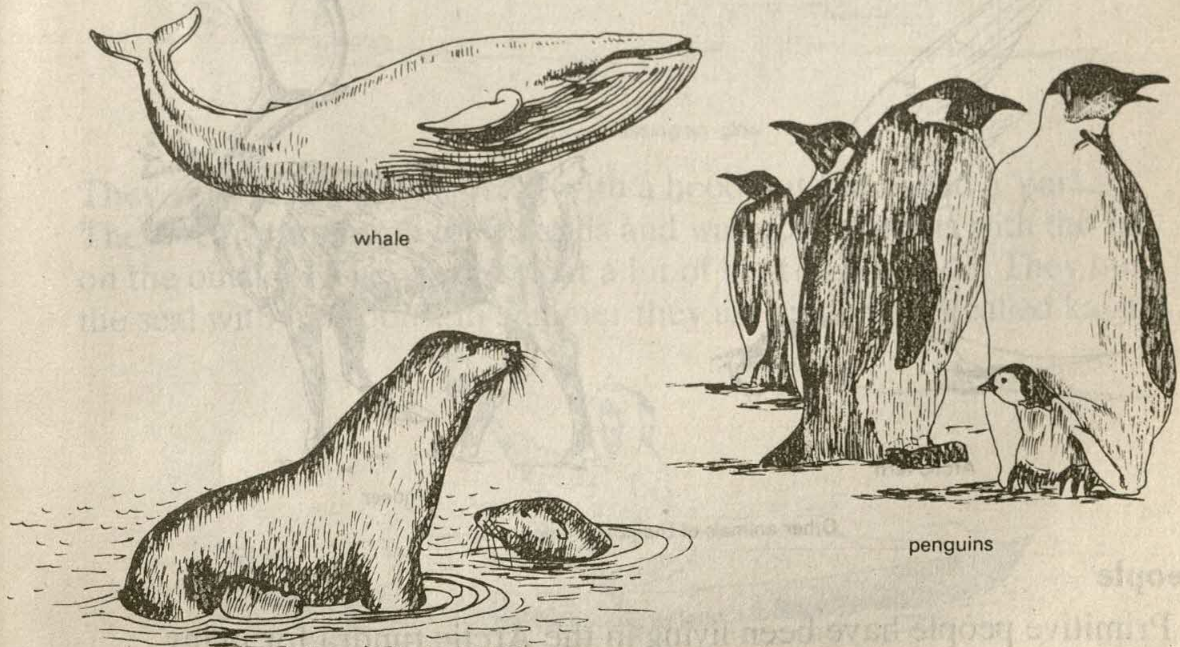
In these areas, the winters are long and cold lasting for almost nine months, and the summers are very short and cool. The tundras are very far from the equator. The sun's rays fall slantingly and are not able to provide much heat; therefore the days are not very warm.

Even in summer only the upper portion of the ice melts, the ground is permanently frozen below. This permanently frozen ground is called 'permafrost'. There is hardly any soil.

Plant and animal life

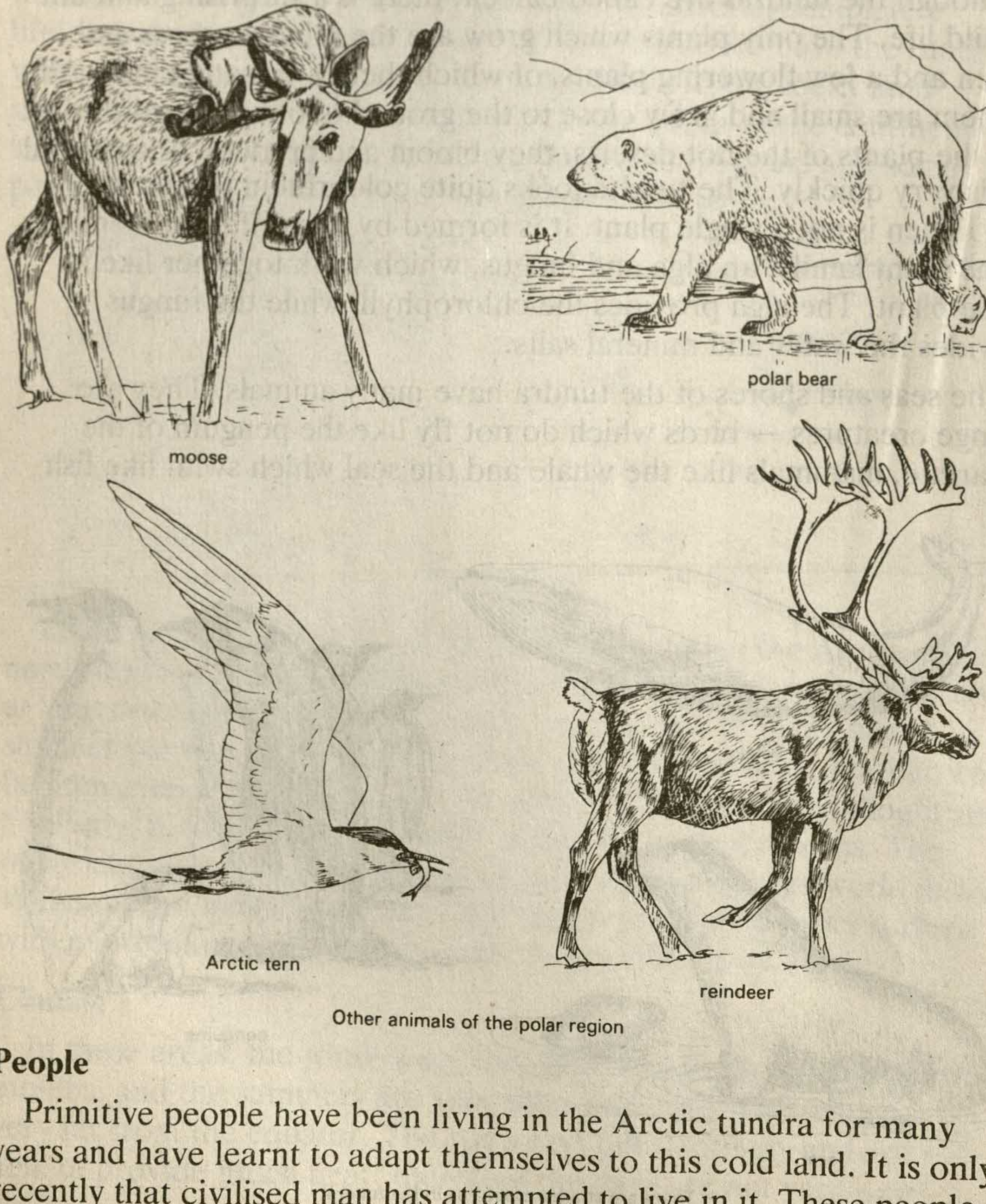
Though the tundras are called barren, there is a surprising amount of wild life. The only plants which grow are the reindeer moss and lichen and a few flowering plants, of which there are many kinds. All of them are small and grow close to the ground to obtain warmth. Just like the plants of the hot deserts, they bloom and produce flowers and seeds very quickly. The tundra looks quite colourful in the summer. The lichen is not a single plant. It is formed by two different members of the plant family, an alga and fungus, which work together like a single plant. The alga provides the chlorophyll, while the fungus provides the water and mineral salts.

The seas and shores of the tundra have many animals. They are strange creatures — birds which do not fly like the penguin of the Antarctic, mammals like the whale and the seal which swim like fish



There are strange creatures in the tundra.

and the large polar bear and reindeer. There are also small animals like the ermine the Arctic hare and lemming. Many of the birds move away to warmer lands in winter. This is called 'migration'. The Arctic tern is the bird which migrates the longest distance, from the Arctic to the Antarctic.



moose

polar bear

Arctic tern

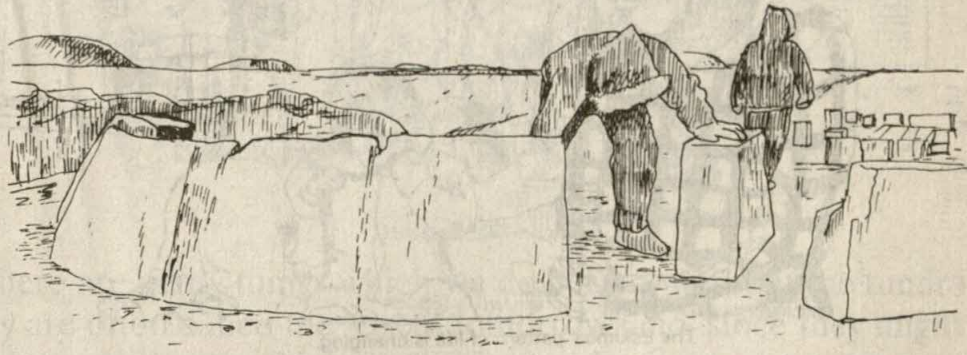
reindeer

Other animals of the polar region

People

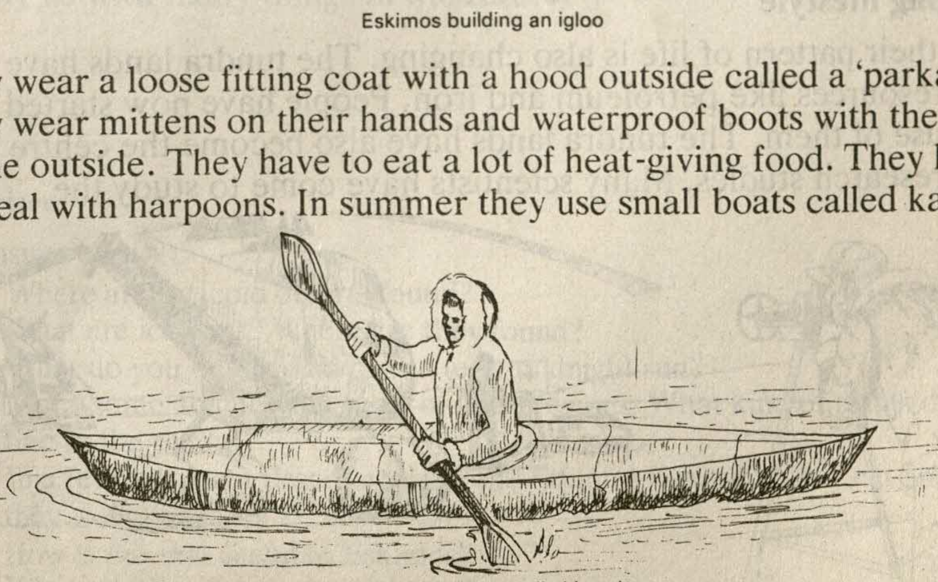
Primitive people have been living in the Arctic tundra for many years and have learnt to adapt themselves to this cold land. It is only recently that civilised man has attempted to live in it. These people are spread over a vast area, and are very few in number, but their way of life is more or less the same. They are all nomadic hunters and fishermen. They also look alike. Some of these people are the Eskimos of Canada and Greenland, the Lapps of Scandinavia, the Samoyeds, Chukchi and Yakuts of Siberia. The Eskimos are found in Alaska, Greenland and Labrador.

These people have learnt to live in these cold regions using whatever is available. In winter they live in houses made of earth-packed stone. In summer they live in tents made of skin. Sometimes they live in snow houses called igloos, which are quite warm. The houses are easily built and taken down, since the Eskimos also have to move from place to place. Their clothes are made of fur and seal skin.



Eskimos building an igloo

They wear a loose fitting coat with a hood outside called a 'parka'. They wear mittens on their hands and waterproof boots with the fur on the outside. They have to eat a lot of heat-giving food. They hunt the seal with harpoons. In summer they use small boats called kayaks.



They use small boats called kayaks.

These are made of wooden frames covered with walrus skins. The seal provides them with most of their needs. Seal skin is used for tents and clothes. The flesh is used for meat and the fat is used for lamps. The bones are used to make hooks, needles and instruments.

In winter they use sleds drawn by teams of dogs called huskies. It would be difficult for the Eskimos to move about in winter without their dog sleds. The Eskimos live a harsh life, yet they are a cheerful people and love children.

The Eskimos' pattern of life is changing.

Changing lifestyle

But their pattern of life is also changing. The tundra lands have many resources like petroleum and iron. People have now started to make use of them. The tundra lands have also become the centre for many research studies. Many scientists have come to study the

Many scientists are studying the tundra lands.

animals, plants and climate of this strange place. The Eskimos are also affected by this. They are taking jobs in the oil drilling and research stations. Schools have been set up to teach the Eskimo children and to train them in their tasks of oil drilling, mining and looking after the instruments on the station. Husky teams are being replaced by snow-mobiles.

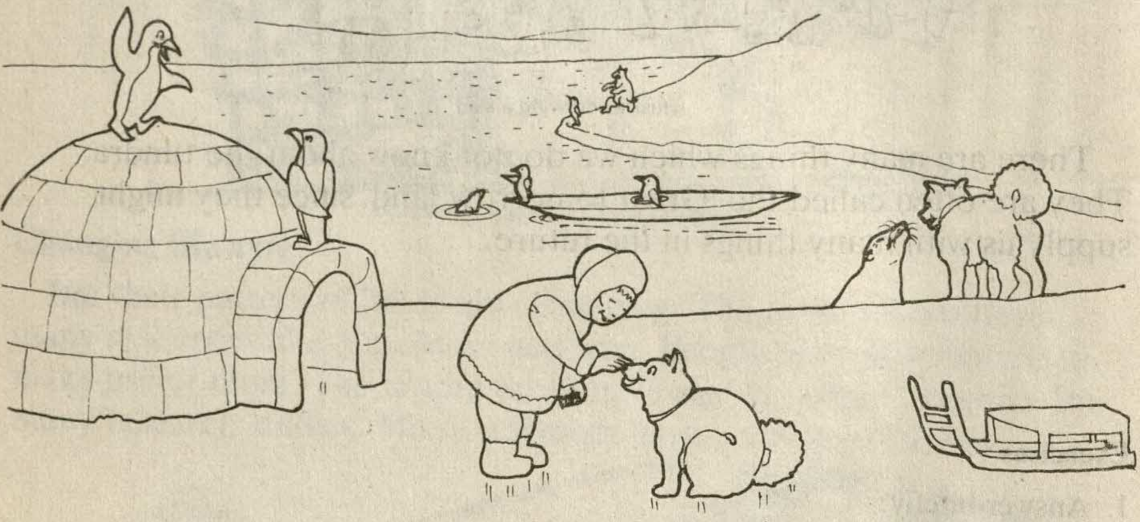
Huskies drawing a sled

There are many things which we do not know about the tundra. They are often called the 'Great tomorrow land' since they might supply us with many things in the future.

Exercises

1. Answer briefly:
   a. Where are the cold deserts found?
   b. What are ice caps? Where are they found?
   c. What do you understand by the term midnight sun?
   d. Name some animals and birds of these regions. What kind of plants do you find in the tundra?
   e. In a few sentences describe where the Eskimos live, what they eat and what they wear.
   f. How is the seal useful to Eskimos?
   g. What are the changes being brought about in the Arctic?

2. Give reasons why:
   a. The polar lands are always cold.
   b. The Eskimos require a lot of heat-giving food.
   c. These lands are called the land of the midnight sun.
   d. The tundras are called the 'Great tomorrow land'.
3. Give one word answers for the following:
   a. barren lands near the poles
   b. a huge sheet of ice covering the land
   c. permanently frozen ground
   d. a plant which grows in the cold desert
   e. dogs used by Eskimos
   f. flightless bird of the Antarctic
   g. bird which migrates the longest distance
   h. people who live in the tundras of Scandinavia
4. Here is a picture of an Eskimo in the Arctic region. Name all the things around him and say how they are useful to him.



Project work

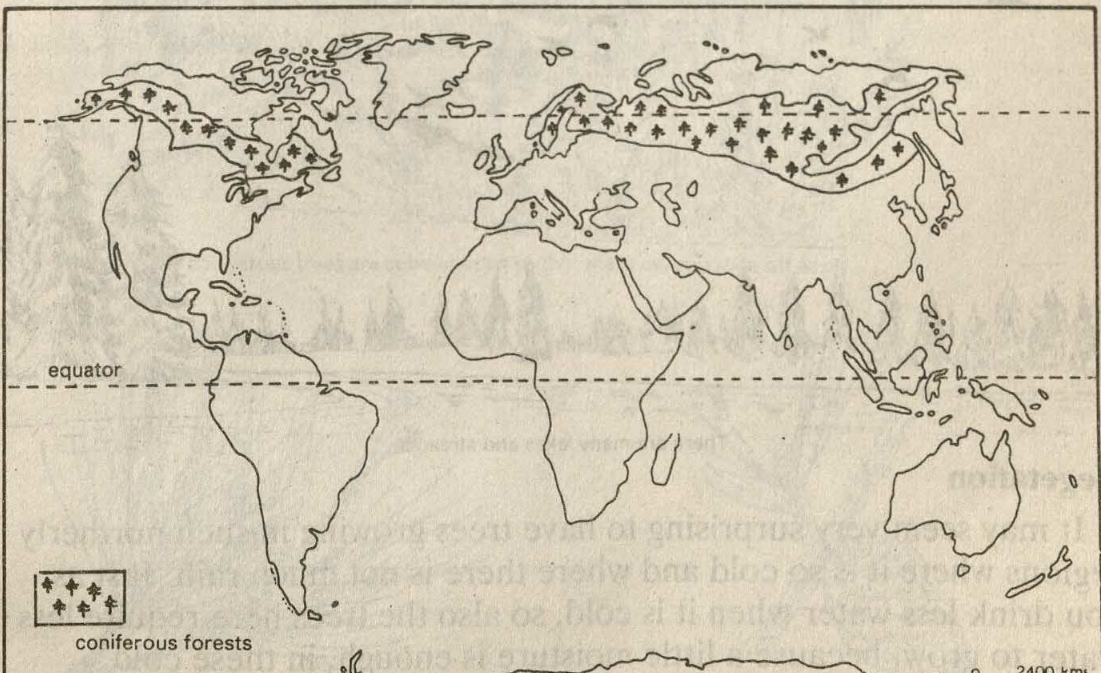
1. On an outline map of the world, mark the tundra areas.
2. Find out from your atlas which countries have this climatic region.
3. Find out about the various Arctic and Antarctic expeditions: Who was the first to reach the north pole and who was the first to reach the south pole? What difficulties did they face?
4. What kind of houses do the people in the tundra live in nowadays?
5. Find out more about the lives of lemmings and penguins.

9. The coniferous forests

South of the tundra, as the summer becomes longer and warmer, we see the vegetation gradually changing. The almost treeless lands give place to small shrubs and stunted trees, till they merge into a thick belt of forests. These are the coniferous forests of the sub arctic region or the cool temperate zone.

Location

These forests are found in the broad belt in the northern hemisphere, south of the tundra lands. They are found in northern Canada, parts of the U.S.A., northern Europe and an unbroken stretch in Siberia (Asia). They are not found in the southern hemisphere because the continents in these latitudes are too narrow, and the right climate for their development does not exist. In North America these forests are called the 'boreal forests' while in Europe and Asia they are called the 'taiga' which means a dark woodland.

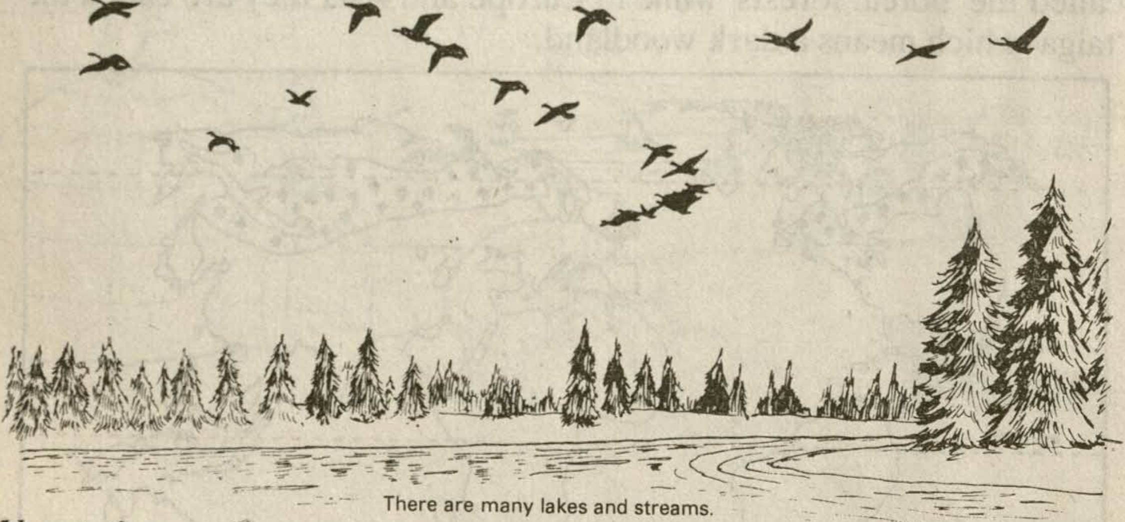


The coniferous forests of the cool temperate zone

Climate

These regions are very much like the tundra regions in winter. The long winters are bitterly cold and the ground is covered with snow. However, summer comes a little earlier and lasts for at least four months. Summer is also warmer than in the tundra regions. Snow falls in winter, and a little rain in summer, but rainfall on the whole is very little.

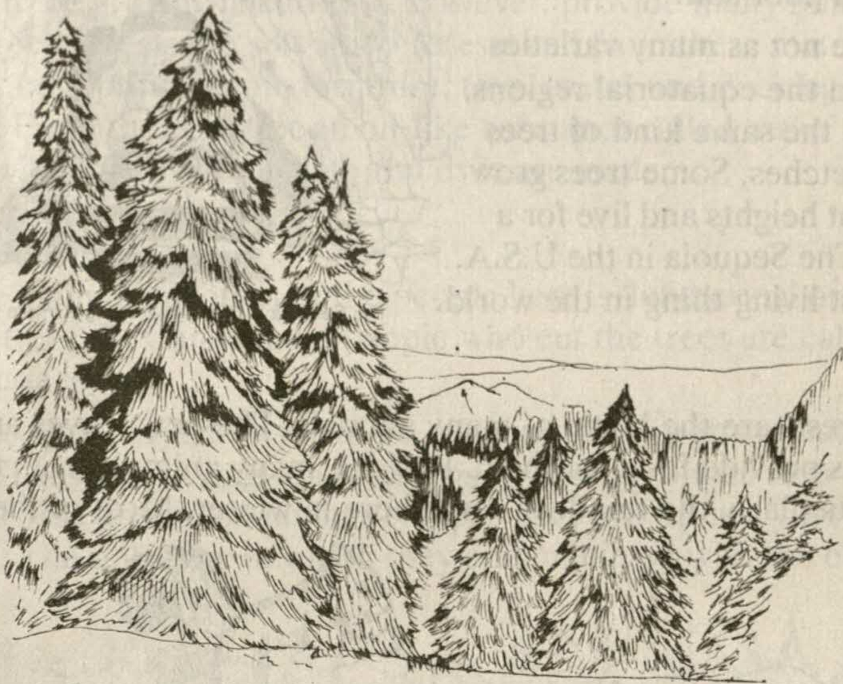
What do these forests look like? In appearance they present a stretch of dark green with a few open spaces here and there. These forests are not like the jungles of the equatorial regions. The variety of trees are few, and below the trees there are not many small plants. The floor is usually covered with pine needles. There are many lakes and streams with a lot of fish. These lakes and streams freeze in winter. When the ice melts in summer, the rivers often flood, causing many marshes, where a large number of mosquitoes breed.



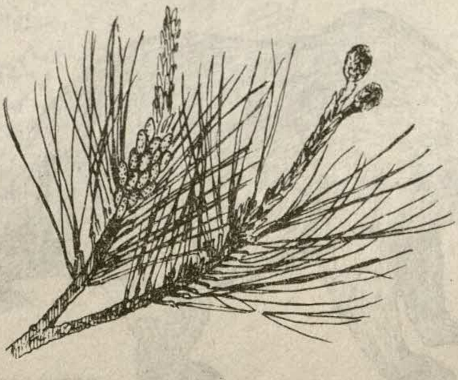
There are many lakes and streams.

Vegetation

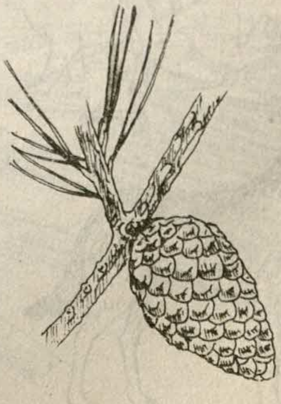
It may seem very surprising to have trees growing in such northerly regions where it is so cold and where there is not much rain. Just as you drink less water when it is cold, so also the trees here require less water to grow, because a little moisture is enough, in these cold climates. The trees are called coniferous because they bear cone-shaped fruits. Examples of coniferous trees are pine, fir, spruce and larch. They are evergreen trees, that is, they are never without leaves. The coniferous tree is ideally suited to live in cold regions: a. The trees are cone-shaped so that the snow can slide off easily. If too much snow gathers on the branches, the branch may break. b. The leaves are thick and needle-like. If the leaf is broad too much water will be lost and so, to prevent loss of water, the leaf surface is small. c. The summers are not long enough for all the leaves of the tree to grow



The coniferous trees are cone-shaped so that the snow can slide off easily.



The leaves are thick and needle-like.



The seeds are kept within a hard cone.

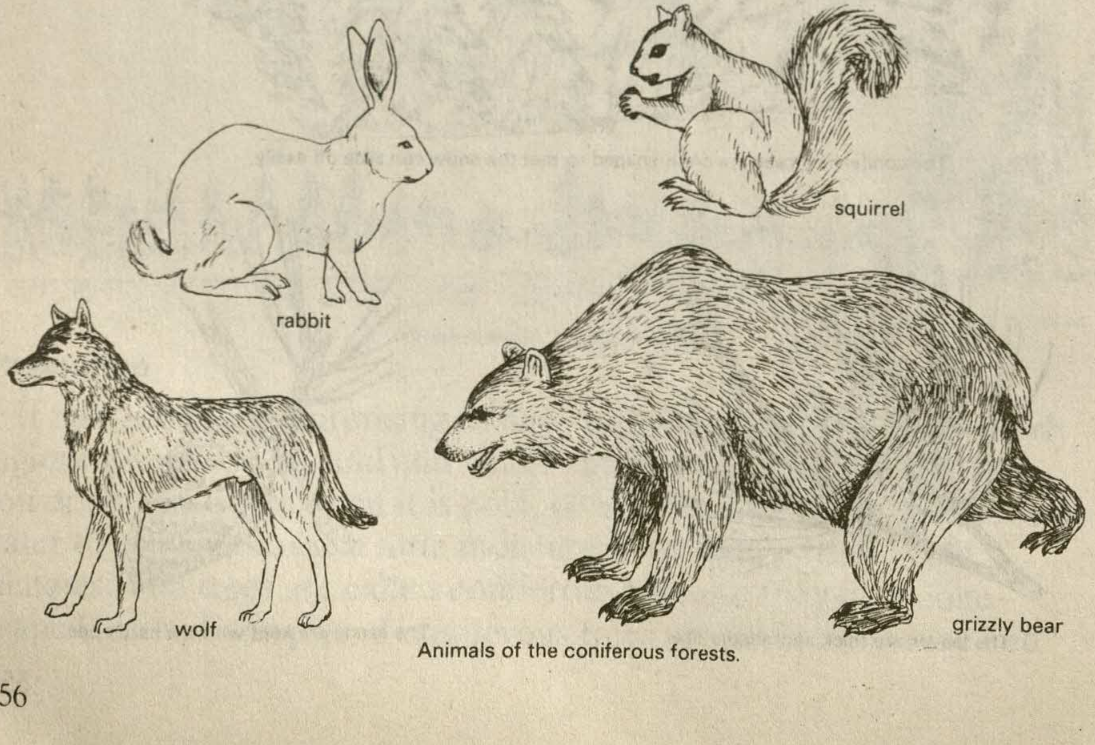
afresh, so the coniferous trees keep their leaves for three to five years. d. The seeds are kept within the scales of a thick hard cone because they take two years to germinate and have to remain on the tree for that length of time. e. The trees can grow on poor soil.

There are not as many varieties of trees as in the equatorial regions, and we find the same kind of trees for long stretches. Some trees grow to very great heights and live for a long time. The Sequoia in the U.S.A. is the largest living thing in the world.

The Sequoia is the largest living thing in the world.

Animal life

These forests are the home of many animals. The new leaves and young cones provide food for them. Besides, many animals from the tundra, particularly the reindeer come here in winter. Most of them



Animals of the coniferous forests.

have thick fur. The beaver, squirrel, rabbit and mink are some of the animals found here. Besides these we find grizzly bears and wolves. The beaver is a natural engineer. It cuts trees with its sharp teeth, builds a dam across the river and lives below it in a 'lodge'. Many small animals hibernate in winter.

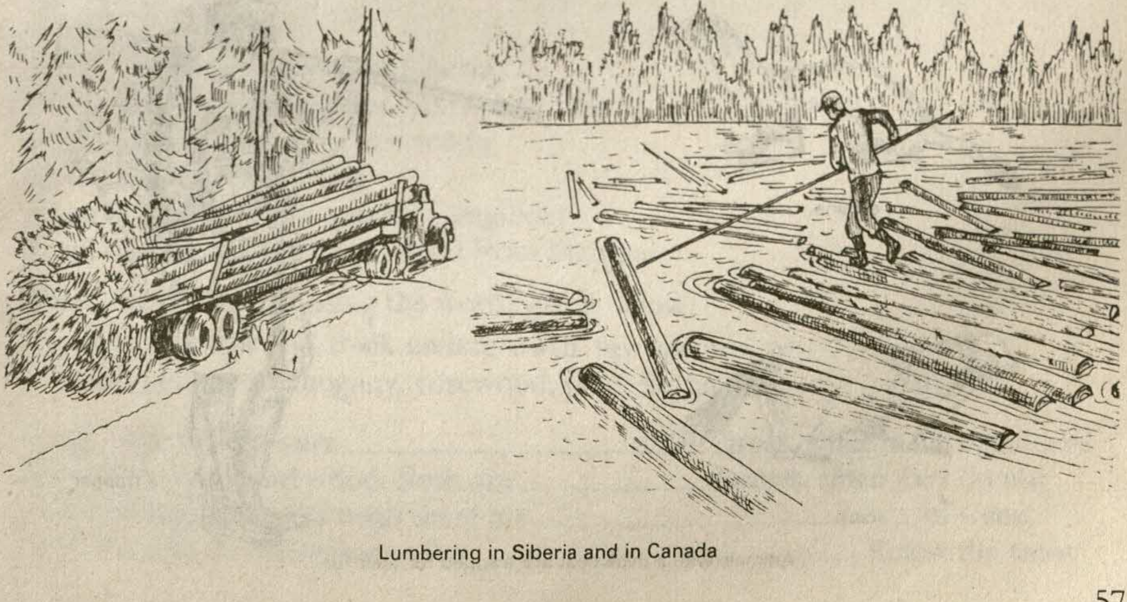
Forest products

In these regions, the soil is too poor and summers too cold for any crops to be grown. The forests, however, provide many things. The evergreen forests are soft wood forests and from these matches, paper, newsprint, rayon, furniture, toys, crates and packing cases are made. From the pine tree an oil-like substance called 'resin' is obtained from which varnishes, paints and dyes are made.

Lumberjacks

The main occupation of the people here is 'lumbering' or cutting down trees. In Canada, the people who cut the trees are called 'lumberjacks'.

These lumberjacks have to go deep into the forests to cut down the trees. They live in huts made of logs or tents, grouped near a river or lake. These are called lumber camps. They are far away from other towns. The only way in which they communicate with the outside

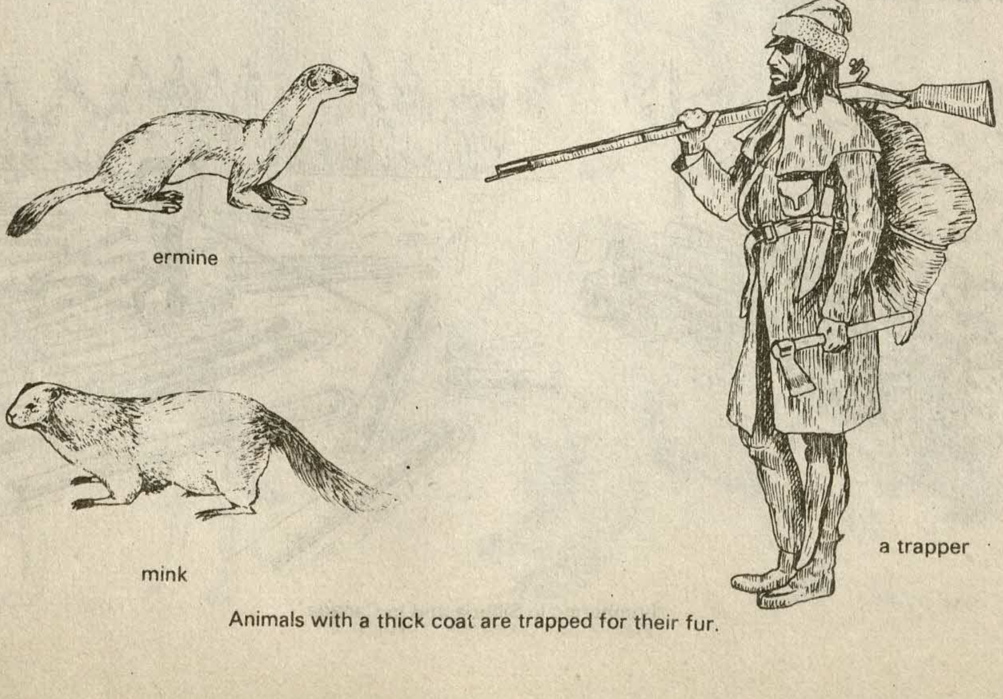


Lumbering in Siberia and in Canada

world is by radio. Supplies of food are brought in by small aeroplanes. The trees are cut in winter. Nowadays they use electrically powered saws, so they can be cut very quickly indeed. They have their own generators. The logs are cut into regular lengths, piled on trucks and carried to rivers which are frozen. When the river water melts in summer, the logs float down the river to the saw-mills nearby, where they are crushed into woodpulp. Of course a few men also have to go along with the wood, to see that the logs don't get jammed. In summer the lumberjack also has to plant new trees to replace the ones he has cut. If this is not done, the forests will soon disappear. He repairs his machines and lays traps for animals which are useful for their fur. He may also take a few weeks' holiday in the towns. It is quite cold in winter here. The ground will be covered with snow. The lumberjack has to wear thick warm clothes to protect himself. He has to wear snow shoes to move from place to place.

Trapping and mining

Besides the lumberjacks we also find trappers and miners. Most animals of the taiga have a thick coat of fur, which can be used to make warm winter clothes. These are very expensive, and the pelts fetch a good price. So traps are laid for animals like mink and ermine,



ermine

mink

a trapper

Animals with a thick coat are trapped for their fur.

and when they are caught, the fur is removed. The trapper may not always find an animal in the traps, so they have established what are called 'fur farms'. Here the animals are bred in captivity. Like the American bison, some of these animals are in danger of dying away completely. There are now movements trying to prevent, completely or partially, the killing of these animals for their fur.

These forest areas are also rich in minerals, and in many areas in Siberia and Canada we find mining centres. However, these settlements are few and far away from each other. The forests still dominate the landscape. They are very valuable to man and must not be cut without thought for the future.

Exercises

1. Answer briefly:
   - a. Where are the coniferous forests located? What are they called?
   - b. Describe how the coniferous tree has adapted itself to the cold climate. Give some examples of coniferous trees.
   - c. What products do you get from coniferous trees?
   - d. Describe the life of a lumberjack.
   - e. Describe the climate of this region.
2. Give the names for:
   - a. the coniferous forests of Siberia
   - b. the coniferous forests of North America
   - c. people who cut trees in Canada
   - d. the largest living thing
   - e. an animal which is a natural engineer
   - f. an oil-like substance obtained from the pine
3. Fill in the blanks choosing the words given below:
   (evergreen, soft wood, thick undergrowth, few species,
   a variety, ebony, mahogany, rosewood, pine, fir, larch)

   In the taiga the trees are ____________ ____________ trees, while in the equatorial forests they are hard wood. Both are ____________ forests, since they do not lose their leaves. In the taiga there are ____________ ____________ of trees, while the equatorial regions have ____________ ____________. Below the trees the ground is open in the taiga while the equatorial forests have a ___________ ___________ . The main trees of the taiga are ___________ , ___________ , ___________ , while the main trees of the selvas are ___________ , ___________ , ___________ .

4. Give reasons why:
   a. The forests of these lands are called evergreen coniferous forests.
   b. In summer there are many mosquitoes.
   c. Not many crops can grow here.

Project work

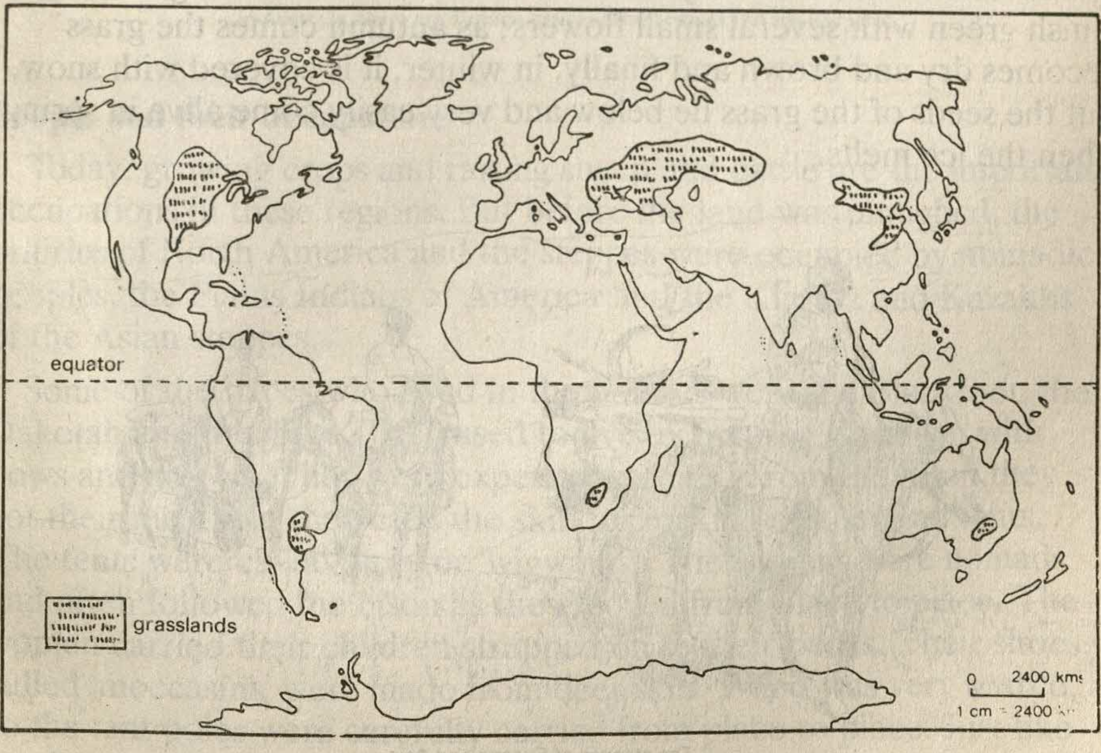
1. On an outline map of the world mark the coniferous forest regions.
2. Find out details about other forests like the deciduous forest – the trees, location, climate and occupation of people.
3. Find out about other products like rayon and matches and how they are made.
4. Find out more about the life of the beaver.

10. The temperate grasslands

In the cool temperate zones, far away from the coastal areas of continents, there is another climatic region. Here are the wide open spaces without any trees where the vegetation is mainly grass. These are the temperate grasslands of the world.

Location

The temperate grasslands are found in the interior of continents. In the northern hemisphere they are the prairies of North America (in the U.S.A. and Canada) and the steppes of Europe and Asia. In the southern hemisphere they are the pampas of South America (in Argentina and Uruguay), the high veldt of South Africa and the downs of Australia (found in the basin of the Murray-Darling river) All these grasslands gradually merge with the deserts to their west.



The temperate grasslands

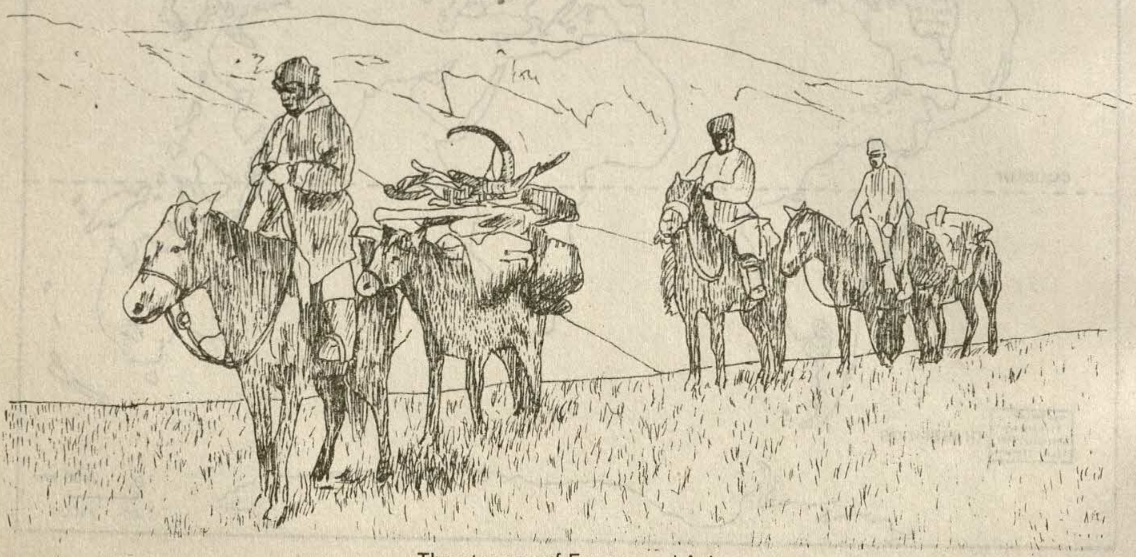
Climate

In these areas it is very hot in summer and very cold in winter. Such a climate is called continental. The difference between summer and winter temperatures is large. This is so because these lands are far away from the sea. Rainfall is very little and falls as rain in summer and snow in winter. In winter very strong and cold winds blow across the land which is flat, with nothing to stop the winds. Often people plant trees round their houses to lessen the force of the wind.

Vegetation

This little rainfall is just enough for grass to grow. The whole area is covered with grass. The grass may be tall and green and cover the whole area, or where there is less rain, it may be short and grow only in clumps. The grass is called either prairie or pampas grass and is mixed with clover, thistle and other flowering grasses. There are hardly any trees. Only along rivers do we find a few trees like poplars, alders and willows.

The land is flat, with very few hills. In early summer the grass is bluish green with several small flowers; as autumn comes the grass becomes dry and brown and finally, in winter, it is covered with snow. But the seeds of the grass lie below and very easily come alive in spring when the ice melts.



The steppes of Europe and Asia

Animal life

The North American prairies were once the home of thousands of bison. Now they are very few in number. In the Asian steppes horses were found in plenty while in Australia there are strange grass-eating animals like the kangaroo.

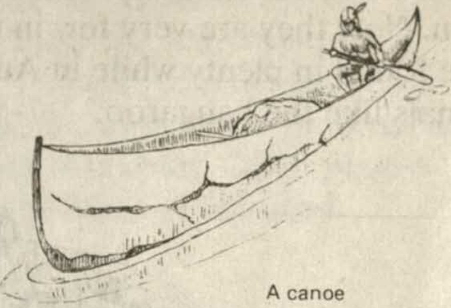
In Australia, there are strange grass-eating animals like the kangaroo.

People and their occupations

Today, growing crops and raising sheep and cattle are the important occupations in these regions. But before the land was ploughed, the prairies of North America and the steppes were occupied by nomadic peoples, the Plains Indians of America and the Kirghiz and Kazakhs of the Asian steppes.

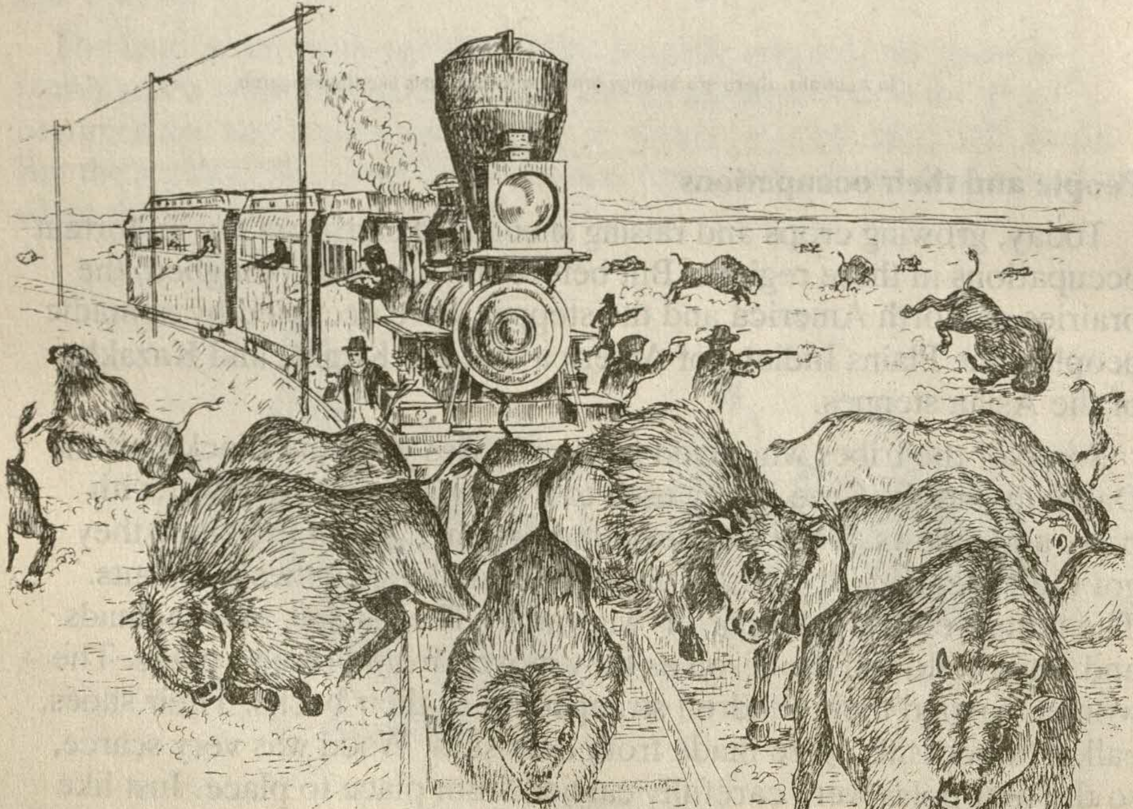
Some of the tribes who lived in the prairies were the Blackfoot, the Dakotah and the Cree. They used to live by hunting the bison with bows and arrows. They were expert horsemen. From the bison they got their meat and they used the skin for making clothes and tents. The tents were called 'tipis' or 'wigwams'. The Indians were nomads and often followed the bison as they moved from place to place. The women carried their children strapped on to their backs. Their shoes, called 'moccasins' were made from deer skin. Wood was very scarce, so the tent poles were carefully carried from place to place. Just like the Eskimos' kayak, these Red Indians had a light boat called a canoe.

Red Indian wigwams



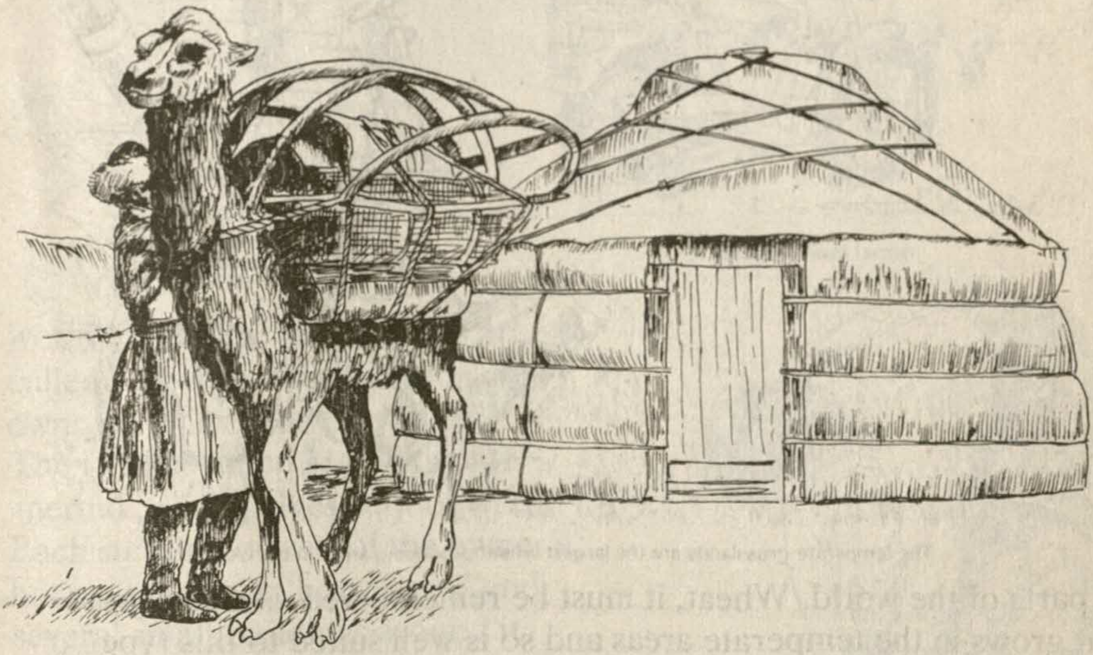
A canoe

They were fierce, warlike people. Once the Europeans came to the plains the bison soon disappeared because they were killed too fast, with guns and, as the bison disappeared, the Indians also gradually gave up their original way of life. Some Red Indians now live in special lands kept for them, called 'reservations'.



The Europeans killed the bison and changed the Indian way of life.

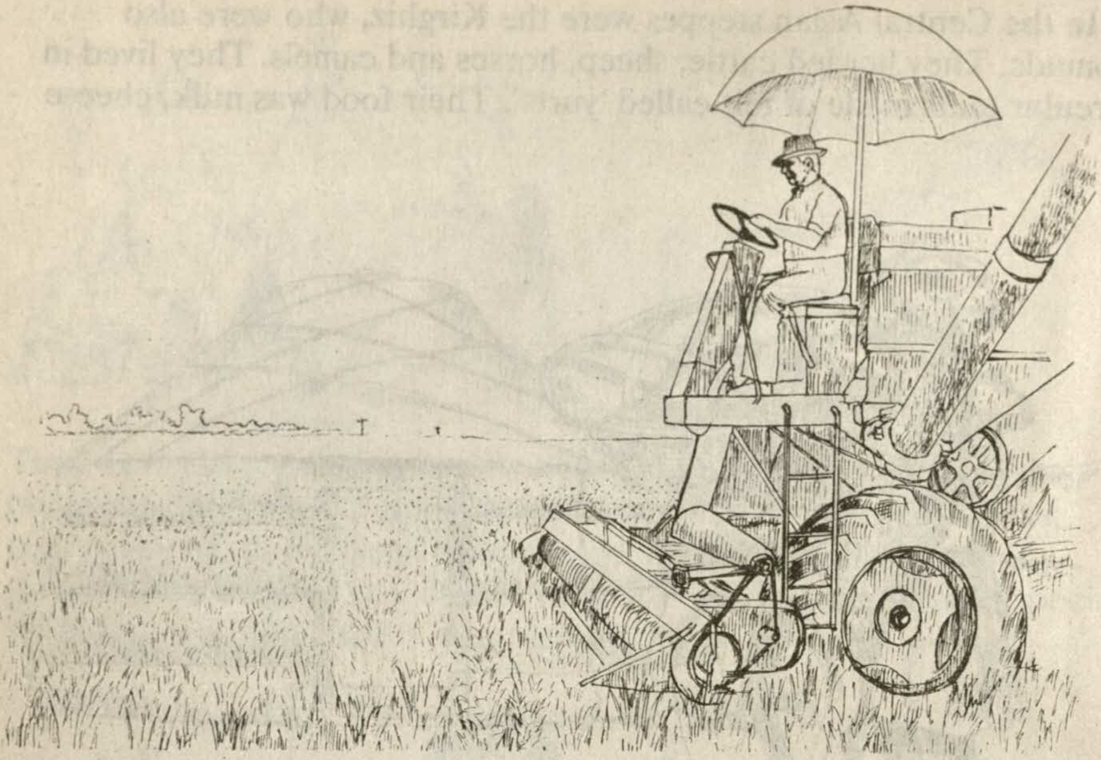
In the Central Asian steppes were the Kirghiz, who were also nomads. They herded cattle, sheep, horses and camels. They lived in circular tents made of felt called 'yurts'. Their food was milk, cheese and occasionally meat. All their utensils were made of leather. They could move about very easily because of their horses and often attacked nearby cities. It is from these steppes that the Mongols, Huns and Tartars came. Now the people of the steppes are no longer nomads. Their land belongs to the Russian State and most of them work in farms.



The Kirghiz used camels and lived in yurts.

Wheat cultivation

The temperate grasslands are today very important for growing wheat. In the wetter areas large quantities of wheat are grown. Under the grass is rich black or brown soil, which is very suitable for raising crops, particularly wheat. These areas are the largest wheat producing areas in the world. The prairies are called the 'bread basket of the world' because they produce so much wheat that it can be exported to



The temperate grasslands are the largest wheat producing areas in the world.

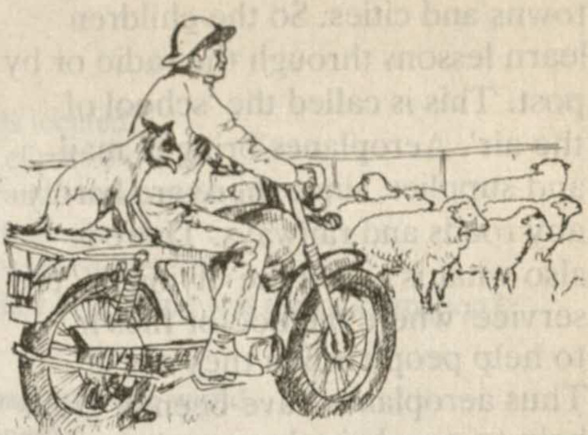
all parts of the world. Wheat, it must be remembered, is also a grass that grows in the temperate areas and so is well suited to this type of climate.

Ranches, estancias and stations

In parts of the grasslands, where there is little rainfall, the grass has not been ploughed under but has been left as it is and cattle and sheep are kept in large numbers. Because the rainfall is light these cattle farms are large, of several thousand acres. In North America they are called ranches, in South America, estancias and in Australia, cattle stations. The men who look after them are called ‘cowboys’,‘gauchos’ and ‘jackeroos’ respectively. In the Central Eurasian steppes, large farms are called kholkhoz and the people who run them are collective farmers. The ways of life of these people are very much the same. Let us look at the life of an Australian sheep farmer.

In the downs of Australia sheep are reared in large numbers for their wool. Australia is the largest wool producing country in the

Herding sheep on horseback



A modern sheep farmer

The fleece is cut by shearers.

world. The large sheep farms are called stations and the person who owns them is called a squatter. The type of sheep reared is the 'merino', which gives a lot of wool. Each station consists of the owner's house, called the 'homestead' and several small buildings around it like the stores, the barns and other small houses for the people working there. There might also be windmills, to raise water from the ground, and pumps.

Each field is fenced into small paddocks. The jackeroos are people who look after the sheep. The paddocks are fenced with barbed wire and the jackeroos have to keep checking if the fence is in good repair. Throughout the year the sheep have to be looked after and moved from paddock to paddock, dipped in medicine, and the wool from the tails clipped. Finally, when the wool is long, the sheep are gathered together. This is called 'mustering'. The fleece is cut by the shearers who move from station to station. They are then sorted into bales and sent to different markets. Many of these stations are very far from towns and cities. So the children learn lessons through the radio or by post. This is called the 'school of the air'. Aeroplanes bring in mail and supplies, since there are hardly any roads and railways. There is also what is called the 'flying doctor service' where the doctor flies in to help people when they are ill. Thus aeroplanes have been of great help to people in these regions.

The school of the air

We see that these grasslands provide much of man's food and clothing. However, once the grass is removed the soil becomes dry and is easily blown away by fierce winds. Many grasslands which were once fertile have become deserts. So, while using these grasslands we have to see that we do not destroy what nature has given us.

Australian aborigines

Like the Indians of the prairies, the original inhabitants of the downs of Australia have suffered a change in lifestyle after the advent of the Europeans. The original Australian 'aborigines' were nomadic hunters and food gatherers. Now they live in reservations or work on sheep farms or in the cities.

Exercises

1. Answer briefly:
   a. Where are the temperate grasslands located?
   b. What do you mean by continental climate?
   c. How are planes useful in the Australian sheep stations?
   d. Who are the jackeroos? What work do they do?
   e. Where did the Red Indians live? Describe their life.
   f. Who are the Kirghiz? Where did they live? What was their occupation?
2. Give reasons why:
   a. The prairies are called the bread basket of the world.
   b. The climate of the prairies is continental.
   c. The winds are strong in the temperate grasslands.
   d. There are windmills in the grasslands.
3. Give names for:
   a. the huts of the Kirghiz
   b. the animal which roamed the prairies
   c. a Red Indian boat and tent
   d. soft shoes made of deer skin worn by Red Indians
   e. the process of cutting wool from the sheep
4. Match the following:

A	B	C
pampas	stations	cowboys
prairies	kholkhoz	gauchos
downs	estancias	collective farmers
steppes	ranches	jackeroos

5. What are the following:
   a. reservations; b. mustering; c. paddocks; d. school of the air.

Project work

1. On an outline map of the world mark and name the temperate grasslands.
2. Find out what is the way of life in a ranch in the prairies and on an estancia in the pampas. How does it differ from that of a sheep station in the downs?

11. Life on mountains

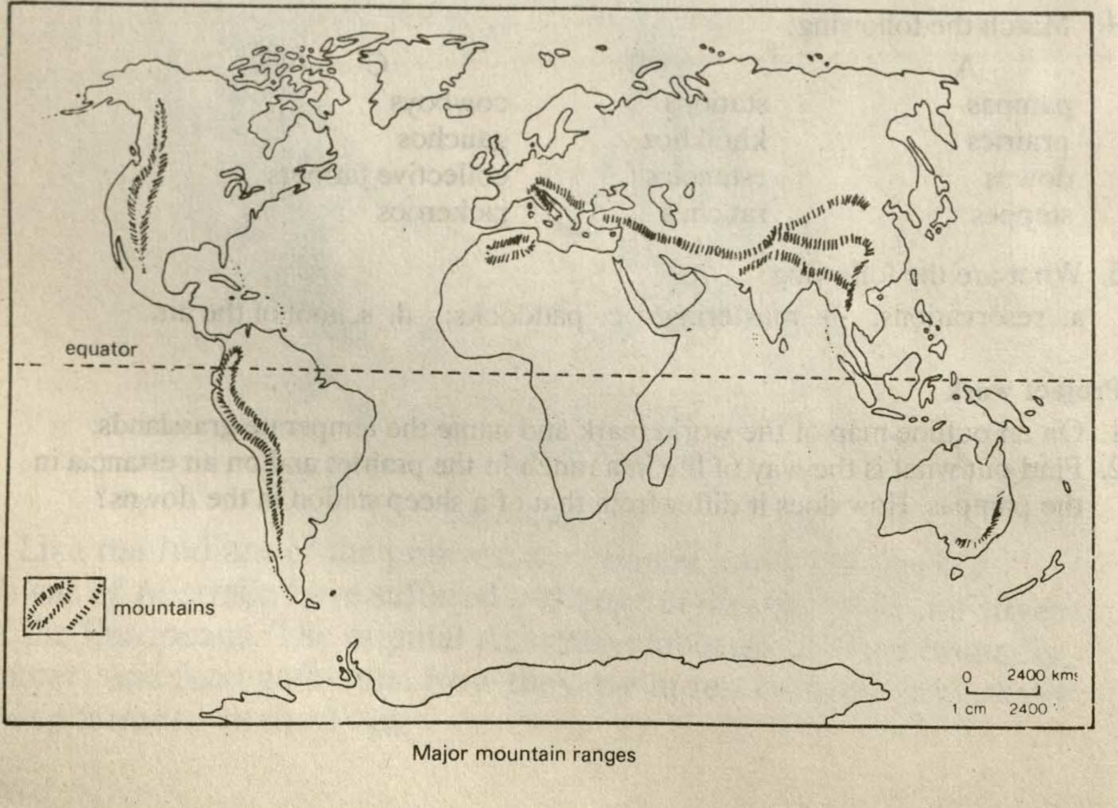
So far you have learnt about the different climatic regions and what these regions look like. Now let us see what type of climate and vegetation the mountains have and how people live on mountains.

Mountains, as you know, are those parts of the earth's surface which are very high and whose tops are pointed in the form of peaks. Mountains are usually found in a long chain called a range.

Location of major mountain ranges

Look at the map and you will find that major mountain chains are found in all the continents. They are the Rockies and Andes in North and South America, the Alps and Himalayas in Europe and Asia, the Atlas mountains in Africa and the Great Dividing Range in Australia.

The highest chain of mountains is the Himalayas, while the longest chain of mountains is the Andes. The highest peak in the world is



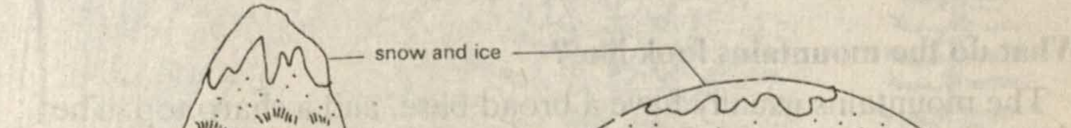
Major mountain ranges

Mount Everest in the Himalayas, on the border of Nepal and China, 29,028 feet or 8,848 metres in height.

Climate

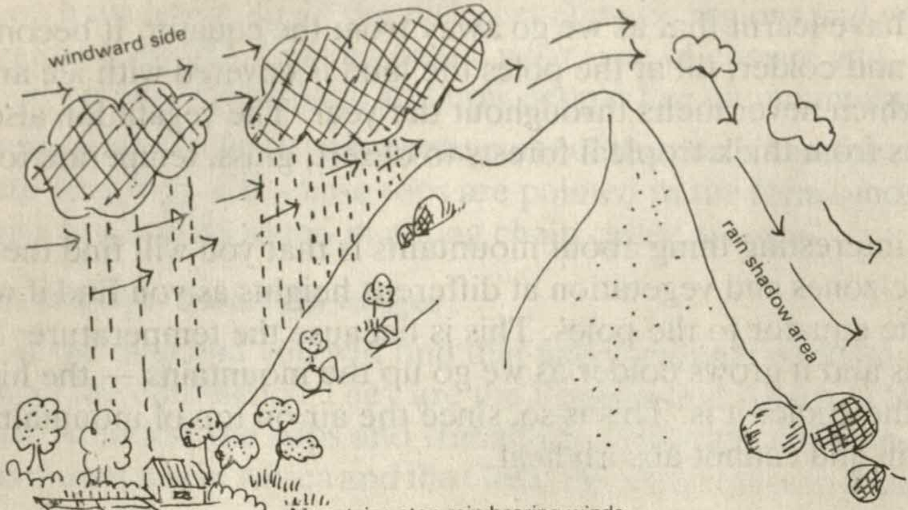
You have learnt that as we go away from the equator, it becomes colder and colder, till at the poles the land is covered with ice and snow which never melts throughout the year. The vegatation also changes from thick tropical forests to desert, grass, temperate forests and so on.

The interesting thing about mountains is that you will find the same climatic zones and vegetation at different heights as you find if we go from the equator to the poles. This is because the temperature changes and it grows colder as we go up the mountains — the higher we go the cooler it is. This is so, since the air on top of mountains is very thin and cannot absorb heat.



You will find the same climatic region and vegetation at different heights as you find if we go from the equator to the poles.

Mountains also get a lot of rain. Since they are high they can stop rain bearing winds. However, one side gets more rain than the other side. The side which gets more rain or which faces the wind is called the 'windward' side. The other side is the 'leeward' side or 'rain shadow' area. The higher slopes get snowfall.



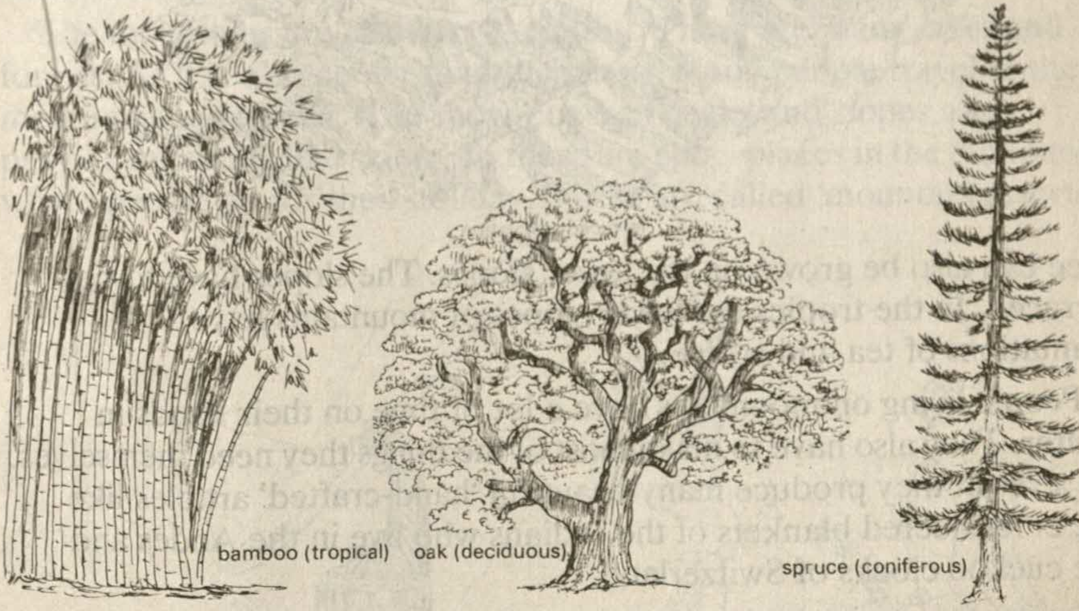
Mountains stop rain bearing winds.

What do the mountains look like?

The mountains usually have a broad base, and a sharp top. The base is called the foothills and the top is the summit or peak. Most of the land is in slopes, there are very few flat lands. In between the mountains there might be a narrow lowland, called a valley. The slopes might be rocky or covered with forests. Most mountains receive a lot of rain and since the land slopes, the water flows down the slopes and forms rivers. Most rivers rise in mountains. The rivers in mountains are very swift and fast. They have many waterfalls. If the mountains are high, a lot of snow collects which becomes ice and flows slowly down the slopes. this slow moving river of ice is called a 'glacier'. When the glacier comes down it melts and gives rise to rivers. The Ganga rises from the Gangotri glacier.

Vegetation

Let us see how the changing temperature affects the vegetation from the foothills to the summit of a mountain. On the lower slopes of a mountain, where it is warmer and rain falls, there may be thick forests. The kind of forests will depend upon the temperature. Those which we find in tropical areas like teak and bamboo, or forests of deciduous trees like oak, ash and maple, will grow on the lower slopes. As we go higher, it becomes cooler and we find forests like those in the taiga, trees like pine, spruce and fir. If the mountains are very high, beyond this line we may find only grasses with many flowers. These are called 'mountain meadows'. Beyond this line, we may find rocky ground or peaks covered with snow. The height beyond which snow never melts but stays on throughout the year, in winter and summer, is called the 'snow line'.



The kind of forests will depend on the temperature.

People and their occupations

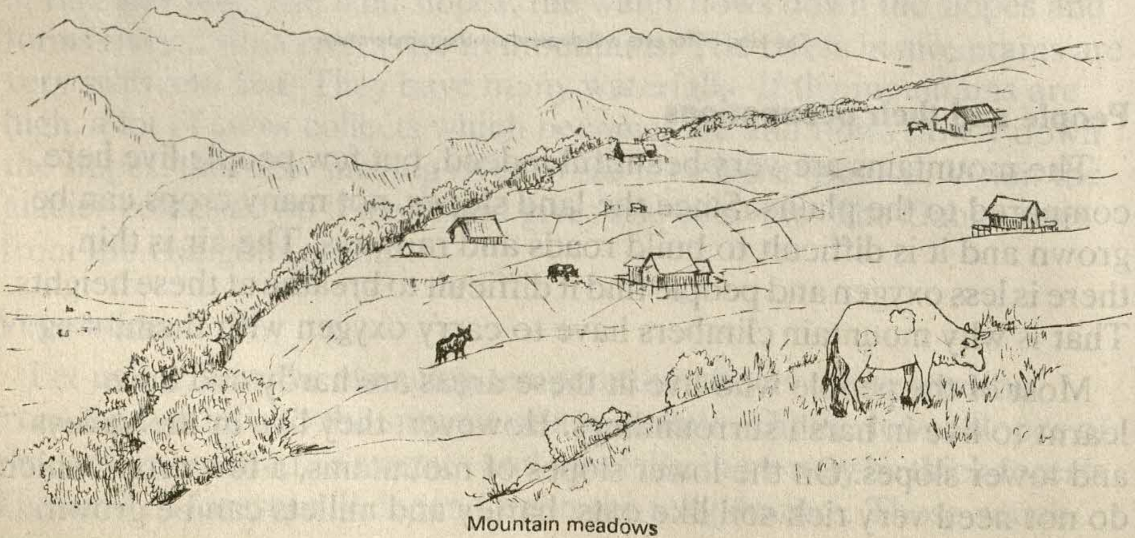
The mountains are very beautiful indeed, but few people live here compared to the plains. Since the land slopes, not many crops can be grown and it is difficult to build roads and railways. The air is thin, there is less oxygen and people find it difficult to breathe at these heights. That is why mountain climbers have to carry oxygen with them.

Most of the people who live in these areas are hardy and have learnt to live in harsh surroundings. However, they live in the valleys and lower slopes. On the lower slopes of mountains, a few crops which do not need very rich soil like oats, barley and millets can be grown.

Terraced cultivation

Rice can also be grown on the lower slopes. The slopes have to be terraced. In the tropics the lower slopes of mountains have plantations of tea and coffee.

People living on mountains have a lot of time on their hands in winter. They also have to make most of the things they need themselves. As a result they produce many beautiful 'hand-crafted' articles like the embroidered blankets of the Indians who live in the Andes and the cuckoo clocks of Switzerland.



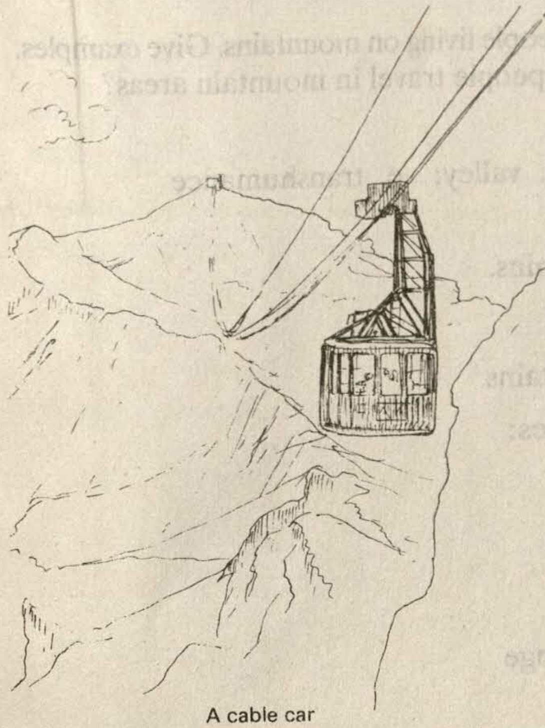
Mountain meadows

The mountains have many forests. These forests produce timber for buildings and for furniture. Therefore lumbering is also important here.

In Switzerland the Alps have very rich grass and meadows. Many cows and sheep are kept here. They are taken up to the pastures in summer and brought down in winter. This is called 'transhumance'. Switzerland produces a lot of milk which is used to make chocolates and cheese. Swiss chocolates are famous the world over.

Mountain resorts

The mountains are also very beautiful. There are many lakes and forests. As it is also cooler than the plains, many people travel to the mountains in summer. The snow-covered peaks and slopes also provide for sports like skiing. So there are many places in the mountains where people go for their holiday. These are called 'mountain resorts'.



A cable car

Skiing on a snow-covered slope

Transport in mountain areas

It is difficult to build roads across mountains. The roads that are built go round and round, so that it is easier to climb the slopes. A mountain railway must have cogs on the wheels of the train so that it does not slip. In many places, particularly Switzerland, cable cars are used to go up the mountain. In many other places, people still use donkeys and mules as transport in mountains. Many people like the adventure of climbing mountains. Tensing and Hilary were the first to climb Mount Everest. Thus the mountains with their forests, snows, lakes and hills are a very beautiful part of our natural environment.

Exercises

1. Answer briefly:
   a. What are mountains? Give some examples.
   b. With a diagram explain how vegetation changes as you go up a mountain.
   c. What do you mean by the windward and leeward sides of a mountain? Illustrate with a diagram.
   d. Name three important occupations of people living on mountains. Give examples.
   e. What are the different ways in which people travel in mountain areas?
2. Define:
   a. snowline; b. glaciers; c. peak; d. valley; e. transhumance
3. Give reasons why:
   a. It becomes cooler as we go up mountains.
   b. Mountaineers carry oxygen.
   c. Very few people live on mountains.
   d. There are several resorts in the mountains.
4. Match the continents and mountain ranges:
   North America
   South America
   Africa
   Australia
   Europe
   Asia

   Alps
   Himalayas
   Andes
   Atlas
   Rockies
   Great Dividing Range
5. Fill in the blanks:
   a. It is ____________ to build ____________ across mountains.
   b. The highest chain of mountains is the ____________ and the longest chain is the ____________ of South America.
   c. Mount ____________ is the highest peak in the world. It was first climbed by ____________ .

d. Vegetation changes as you go __________ a mountain just as it does as you go from the __________ to the __________ .

e. The Ganga rises from the __________ glacier.

Project work

1. On an outline map mark the main mountain ranges of the world.
2. Name some hill resorts of India.
3. Read and learn more about Switzerland and paste some pictures of that country in your map.
4. List a few reasons why you would like to go to a mountain resort for a holiday.
5. Do some extra reading about the Everest expedition of Tensing and Hilary. Find out who the 'Sherpas' of Nepal are.
6. From your atlas, find out which are the highest peaks in the Alps, Andes, Rockies and the Great Dividing Range. Find the ten highest peaks in the world and find out to which mountain ranges they belong.

UNIT III *HOW WE GOVERN OURSELVES*

12. Our constitution

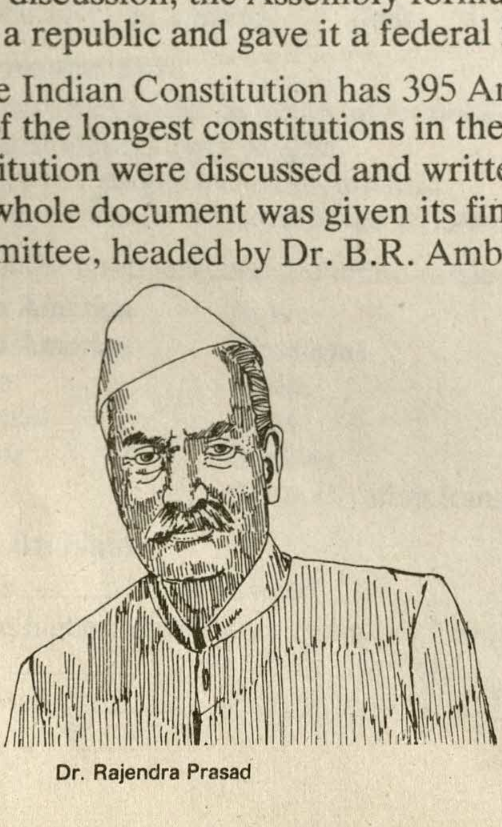
On August 15, 1947, India became independent. On January 26, 1950, the country adopted a new constitution, a new set of basic rules by which the country was to govern itself.

The writing of the constitution

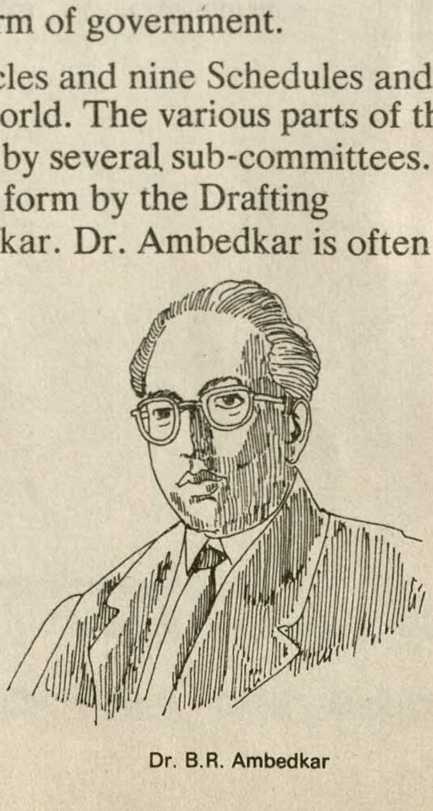
These 'rules' were formed by a Constituent Assembly which was set up in 1946 soon after it was decided that India would shortly become independent. Dr. Rajendra Prasad was the president of the Constituent Assembly. He was later (in 1952) elected the first President of India.

The Constituent Assembly studied the constitutions of various other countries like Britain, France, the U.S.A. and the U.S.S.R. After much discussion, the Assembly formulated a constitution which made India a republic and gave it a federal form of government.

The Indian Constitution has 395 Articles and nine Schedules and is one of the longest constitutions in the world. The various parts of the constitution were discussed and written by several sub-committees. The whole document was given its final form by the Drafting Committee, headed by Dr. B.R. Ambedkar. Dr. Ambedkar is often



Dr. Rajendra Prasad



Dr. B.R. Ambedkar

called the father of the Indian Constitution. The constitution was adopted in November 1949 and came into force on January 26, 1950.

The preamble

The preamble or introduction to the constitution reads:

"We, the people of India, having solemnly resolved to constitute India into a sovereign socialist secular democratic republic and to secure to all its citizens:

Justice, social, economic and political;

Liberty of thought, expression, belief, faith and worship;

Equality of status and of opportunity; and to promote among them all

Fraternity assuring the dignity of the individual and the unity and integrity of the nation;

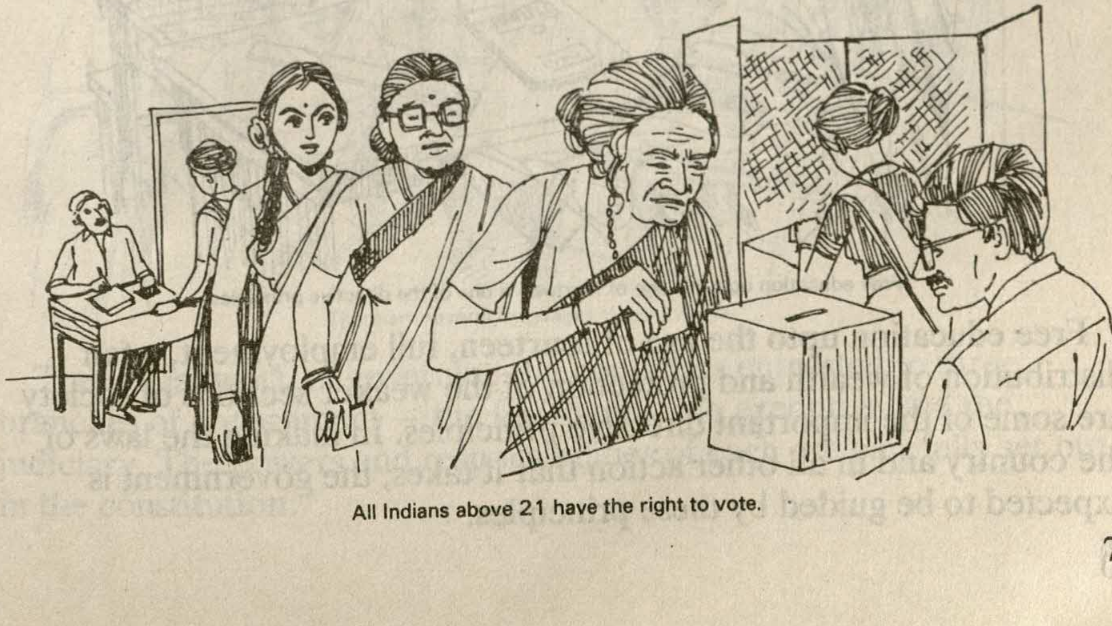
In our Constituent Assembly this twenty-sixth day of November 1949, do hereby adopt, enact and give to ourselves this constitution."

'Socialist' means that we aim to build a society where there is equal distribution of wealth.

'Secular' means that people of all religions will be treated alike and that every Indian can live according to his or her personal beliefs.

'Fraternity' means brotherhood.

So our aim, as a country, as set out in the preamble, is to try and live in fairness and friendliness towards each other.



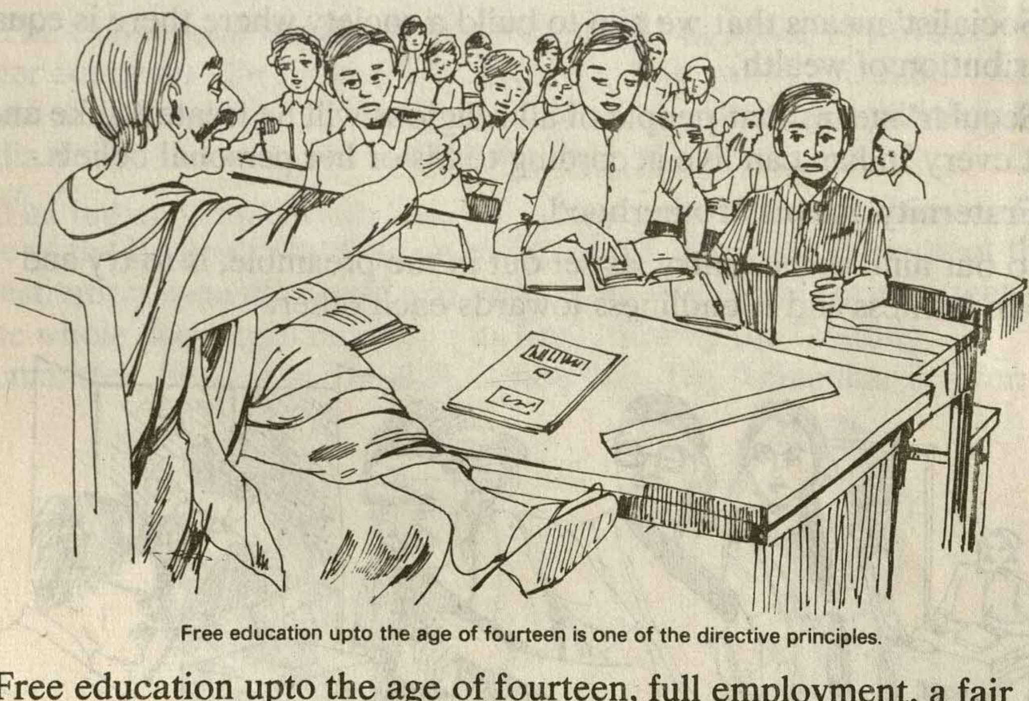
All Indians above 21 have the right to vote.

Power belongs to the people

The constitution also declared India to be a democratic country. This means that the power of government belongs to the people as a whole and not to any individual or group. In practice, democracy means that the people elect their representatives to form the various bodies of government and to govern on their behalf. Democracy also means that in electing the people's representatives, all Indians above 21 have the right to vote and the votes of all Indians are equal in value. This is known as 'universal suffrage'.

Directive principles

The part of the constitution which sets out the aims to be followed by our government is called the Directive Principles of State Policy. These principles are what the government must try to achieve. But they cannot be enforced as other parts of the constitution can be.



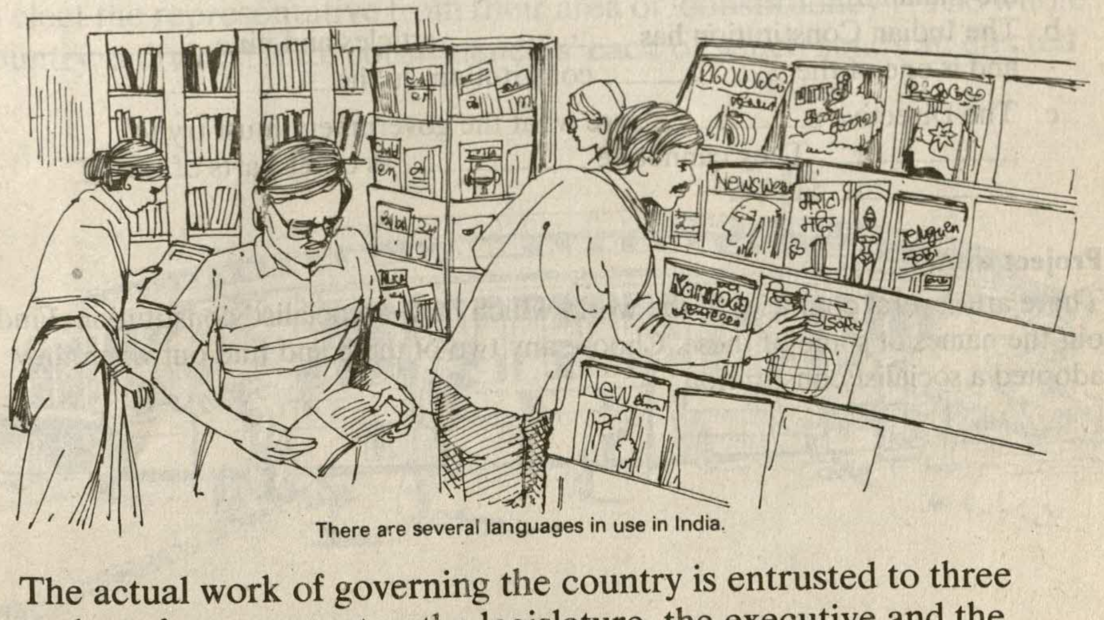
Free education upto the age of fourteen is one of the directive principles.

Free education upto the age of fourteen, full employment, a fair distribution of wealth and protection of the weaker sections of society are some of the important directive principles. In making the laws of the country and in all other action that it takes, the government is expected to be guided by these principles.

A federal system

India is made up of 22 States and nine Union Territories. Besides the central or union government in New Delhi, the states each have their own government. The constitution provides that subjects of national importance should be dealt with by the union government. Defence, communication, finance, foreign affairs and international trade are some of these. Certain other subjects are dealt with by the state governments while there are some areas in which both union and state governments have authority. Such a system, in which power is shared between the union and state governments, is called a 'federal' system. The Indian Union is a 'federation'.

There are several languages in use in India and the constitution recognises the fifteen major languages of the country. It also provides that Hindi in the Devanagri script shall be the official national language but that the use of English as a 'link' language shall be continued as long as it is required. States are free to adopt Hindi, English or any other language spoken in the state as the official state language.



There are several languages in use in India.

The actual work of governing the country is entrusted to three branches of government – the legislature, the executive and the judiciary. The powers and responsibilities of each are carefully set out in the constitution.

Exercises

1. Answer briefly:
    a. When was the Constituent Assembly formed? Who was its president?
    b. What was Dr. B.R. Ambedkar's role in the writing of the constitution?
    c. How do the people of a democracy exercise the power of government?
    d. List three important aims set out in the directive principles.
    e. How many states and union territories are there in India?
2. Define the following:
    a. universal suffrage
    b. federation
    c. secular
    d. fraternity
3. Write a short paragraph on each of the following:
    a. the preamble to our constitution
    b. sharing of power between the union and state governments
    c. the official languages of India
4. Fill in the blanks:
    a. The Constituent __________ studied the constitutions of other __________ like Britain, __________ and __________ before writing the Indian __________.
    b. The Indian Constitution has __________ articles and nine __________ and is one of the __________ constitutions in the __________.
    c. The Directive __________ are what the government must try to __________. They cannot be __________ as other parts of the __________ can be.

Project work

There are several countries in the world which have a 'socialist' constitution. Find out the names of some of these. Choose any two of them and find out when they adopted a socialist constitution.

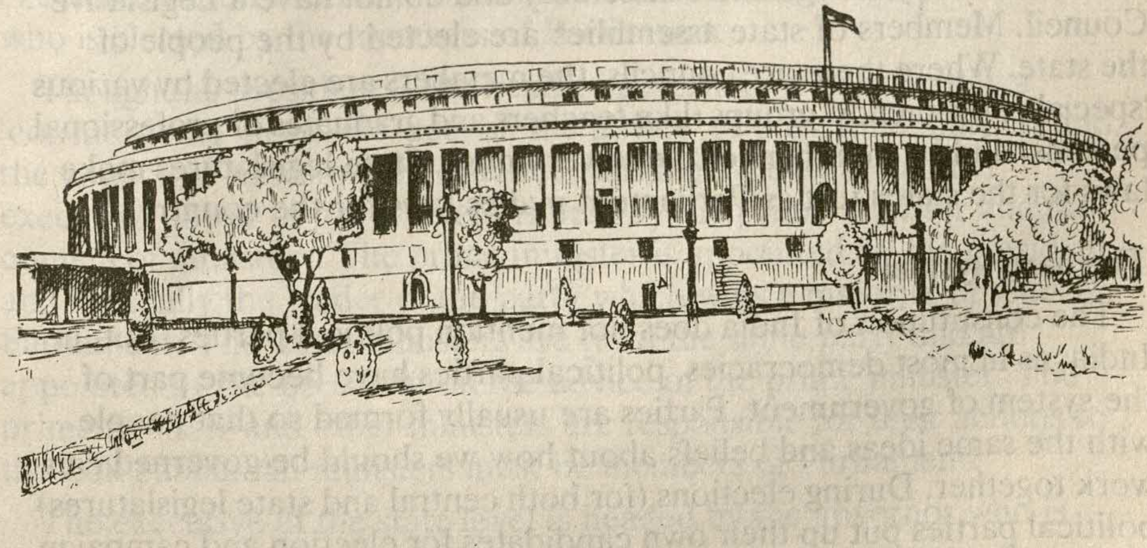
13. Legislature, executive and judiciary

The government of a country or state has several functions and responsibilities. It has to make laws. It has to implement those laws, that is, take action on the basis of the laws. It has to make sure that all laws and actions are within the limits set out by the constitution and that all citizens are dealt with equally and fairly.

There are thus three major functions of government — legislative, executive and judicial. Each function is the responsibility of a separate part of the government though sometimes powers and responsibilities overlap.

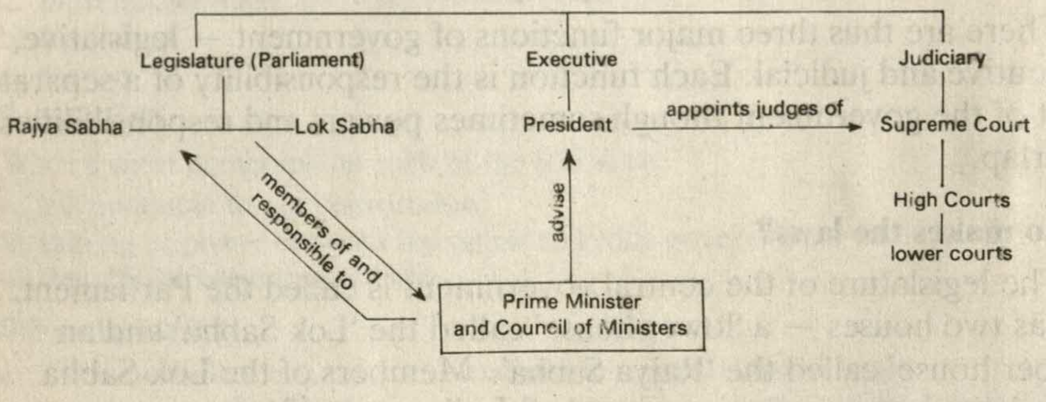
Who makes the laws?

The legislature of the central government is called the Parliament. It has two houses — a 'lower house' called the 'Lok Sabha' and an 'upper house' called the 'Rajya Sabha'. Members of the Lok Sabha are elected once in five years and all Indians over 21 years can vote to elect the representative from their area or 'constituency'. (The whole country is divided into 'constituencies' each of which sends an elected



Parliament building.

representative to the Lok Sabha.) Most Rajya Sabha members are elected by the state assemblies. Some members are appointed by the central government. Laws must be passed by a majority vote in both houses but, in certain cases, the Lok Sabha, which is directly elected by the people, has more powers than the Rajya Sabha.



The union government

Most states also have legislatures made up of upper and lower houses – a Council and an Assembly. But there are some states which have only a Legislative Assembly and do not have a Legislative Council. Members of state assemblies are elected by the people of the state. Where there are councils, the members are elected by various 'special constituency' groups (like teachers and graduates or professional persons) and by members of the lower house. State legislatures make laws for the states just as Parliament makes laws for the country.

The party system

The constitution of India does not mention political parties. But, in India, as in most democracies, political parties have become part of the system of government. Parties are usually formed so that people with the same ideas and beliefs about how we should be governed can work together. During elections (for both central and state legislatures) political parties put up their own candidates for election and campaign to get as many of them as possible elected. Some people also stand for

During elections, political parties and candidates campaign for votes.

election as 'Independents' (not belonging to any political party). At both central and state levels, the party which gets the most people elected usually forms the government. All central and state elections are organised by a body called the Election Commission.

Who implements the law?

The executive takes action to put the laws into effect. The head of the union executive is the President of India. He is elected by the elected members of Parliament and all the state legislatures. The president is the supreme commander of the armed forces and all executive action is done in his name. There is also a vice-president who is elected by the members of Parliament.

Though the president is the head of government he is mainly a 'constitutional' head. He 'acts on the advice' of the prime minister and the council of ministers. In practice, this means that the actual executive power of government is held by the prime minister and the council of ministers. The prime minister is appointed by the president and is usually the leader of the party which wins a majority of seats in Parliament. The other ministers are from the same party and are appointed by the president on the advice of the prime minister. The prime minister and other ministers are responsible for their actions to the Lok Sabha. All ministers must be members of Parliament.

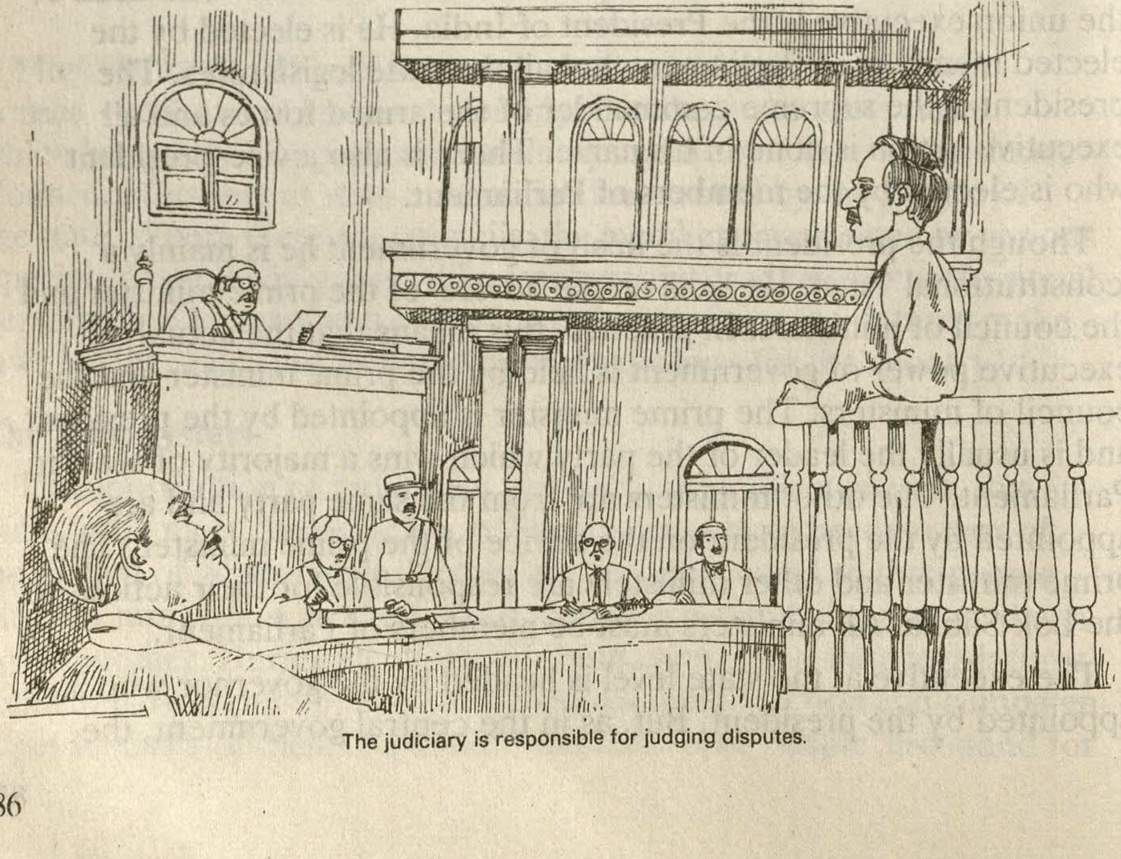
The executive at the state level is headed by the governor who is appointed by the president. But, as in the central government, the state governor acts on the advice of the chief minister and his council of ministers, all of whom belong to the majority party in the state legislature.

Among the nine Union Territories, some are governed directly by Lieutenant Governors appointed by the president. Others have an elected legislature with a chief minister and a council of ministers, as well.

Who is the referee?

The judicial system is common to the whole country. The judiciary is responsible for judging disputes whether they are between private citizens or between a citizen and a government or between different bodies of government. The judiciary administers justice and punishes those who break the laws. It also safeguards the rights and liberties of citizens by making sure that government does not go beyond the limits laid down by the constitution.

At the lowest level of the judiciary are the munsif's and magistrate's courts which judge minor disputes. Then there are the district courts and the high courts of each state. An appeal against the judgement of a high court can be made to the Supreme Court.



The judiciary is responsible for judging disputes.

The Supreme Court is the highest court in the land. It hears cases on appeal as well as cases between states. If any law passed by a legislature is challenged by anyone, the Supreme Court decides whether that law is according to the constitution. This is an important responsibility since a law that is not within the constitution is no longer a law. The power of the Supreme Court to judge this provides a safeguard against the legislature and the executive misusing their powers. Judges of the Supreme Court are appointed by the President.

The constitution is the most important law of the land. All other laws must follow it. But the constitution can be changed. This is done by a special law called an 'amendment' for which a majority of two-thirds in Parliament is required.

Exercises

1. Answer briefly:
   a. What are the three major functions of government?
   b. Which are the three institutions which fulfil these functions?
   c. Which are the bodies to which members are elected directly by the people? Which bodies have members who are elected indirectly?
   d. Who is the head of government? Does he actually exercise the executive power?
   e. What is an 'amendment' to the constitution?
2. Fill in the blanks:
   a. The legislature of the Central Government is called the ________ . It has two ________ ; a lower ________ called the ________ ________ and an upper ________ called the ________ ________.
   b. The ________ acts on the advice of the ________ ________ and the Council of ________ .
   c. Among the nine Union ________ , some are governed directly by ________ ________ appointed by the president. Others have elected ________ also.
3. Correct the following:
   a. All members of Parliament are elected directly by the people.
   b. The prime minister does not belong to any political party.
   c. Each state has its own Supreme Court.
   d. The constitution can never be changed.

4. Give reasons why:
   a. In some cases, the Lok Sabha has more powers than the Rajya Sabha.
   b. People form political parties.
   c. The president can be called a 'constitutional' head.
   d. The prime minister and other ministers are from the majority party in the legislature.
   e. The Supreme Court has the power to decide whether a law is according to the constitution.

Project work

How many political parties do you know of? List them and find out the names of a few more. The Election Commission allows each party a symbol which is used when the party campaigns for votes during an election. Find out the symbol of each party in your list. Draw each symbol against the name of the party.

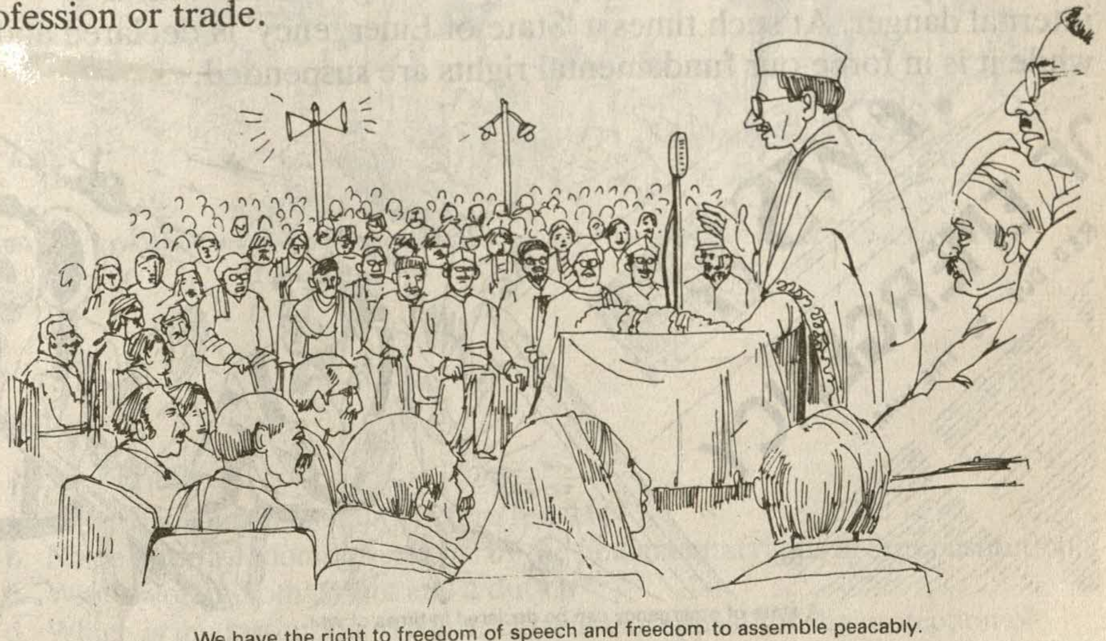
14. Rights and duties

All Indian citizens have certain rights as well as certain duties. These are dealt with in the constitution in the sections on 'Fundamental Rights' and 'Fundamental Duties'.

Fundamental rights

The first of these is the right to 'equality before the law' that is, the right to be treated as equals whatever our position, wealth, sex, religion, caste or community.

We have the right to several 'freedoms', such as freedom of speech and expression; freedom to assemble peacably and to form associations and unions; freedom to live in any part of India and to practise any profession or trade.

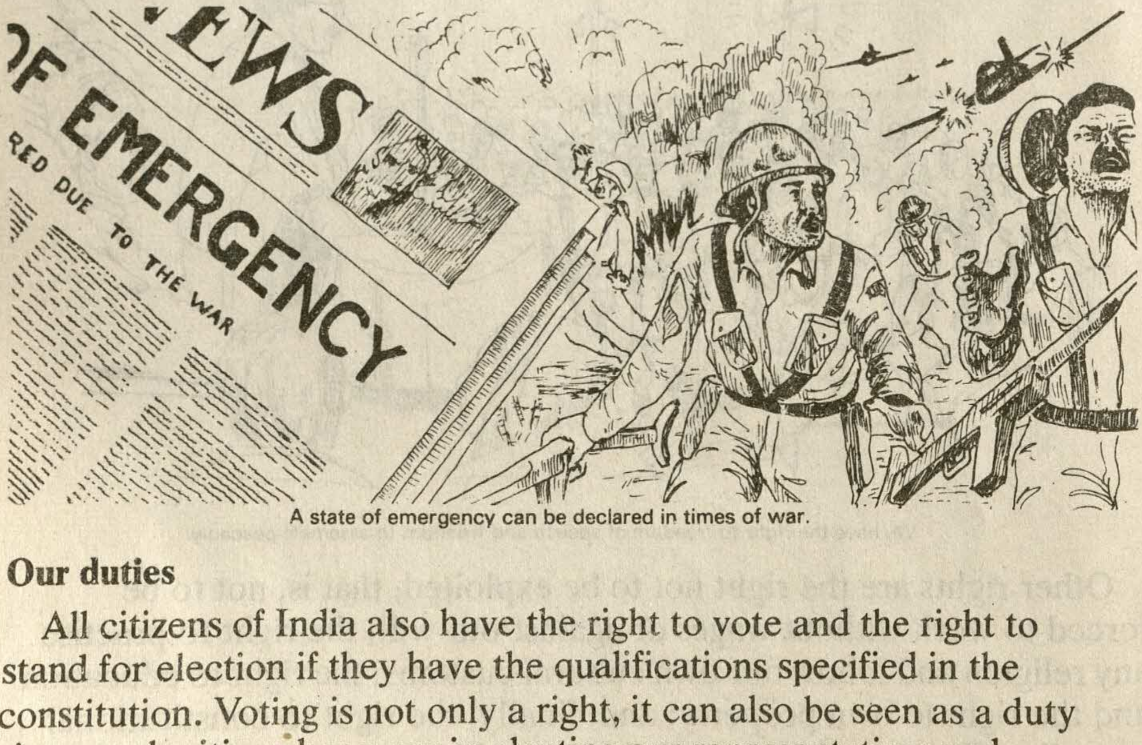


We have the right to freedom of speech and freedom to assemble peacably.

Other rights are the right not to be exploited, that is, not to be forced to work without wages or against our will; the right to practise any religion and follow our own cultural customs; the right to education and the right to own property; and, finally, the right to constitutional remedies. This last right means that any citizen can go as high as the Supreme Court to protect his or her rights.

We have the right to practise any religion.

The fundamental rights are one of the most important parts of the constitution. But they can be suspended during times of war or of internal danger. At such times a 'State of Emergency' is declared and while it is in force our fundamental rights are suspended.


EWS
F EMERGENCY
RED DUE TO THE WAR

A state of emergency can be declared in times of war.

Our duties

All citizens of India also have the right to vote and the right to stand for election if they have the qualifications specified in the constitution. Voting is not only a right, it can also be seen as a duty since each citizen has a say in electing our representatives and therefore in choosing our government.

Fundamental duties demand that a citizen should live in peace and harmony with other citizens and respect their rights. It is also our duty to defend the country in times of danger; not to break any of the laws of the country and to pay taxes and other dues to government. We should also preserve our cultural heritage, help to preserve our environment and protect the animals and birds of our country.

We should preserve our environment and protect the animals and birds of our country.

Exercises

1. Answer briefly:
   a. What is meant by 'equality before the law'?
   b. Name three freedoms given to us by the fundamental rights in the constitution.
   c. Why is voting both a right and a duty?
   d. Which is the institution to which citizens can appeal for the protection of their fundamental rights?

2. Fill in the blanks:
   a. Fundamental ____________ can be suspended when a state of ____________ is declared. This happens during times of ____________ or other danger.
   b. Our duties include paying ____________ and not breaking the ____________ of our ____________ .

3. Tick the correct sentences. Correct those that are incorrect:
   a. Citizens of India have several rights and no duties.
   b. Freedom of speech is one of our fundamental rights.
   c. Our fundamental rights can never be suspended.
   d. In exercising our rights, we can ignore the rights of others.

Project work

1. Find out how many times and for what reasons a state of emergency has been declared in India.
2. If a person insists that his freedom of speech is limitless, and talks over a loudspeaker when it is a disturbance to others, he is ignoring their right to live peacefully. Can you think of three other instances where insisting on one's own rights is unfair to others?

15. The United Nations

War has existed for as long as people have lived together in groups. But in modern times, war has become more and more dangerous as weapons with ever greater destructive power are being made.

After the Napoleonic wars, in the early 19th century, there was an attempt, called the Grand Design, to convince the nations of Europe that cooperation is better than war. The attempt did not succeed.

Again, after World War I (1914-1918), a League of Nations was formed, for countries to meet and discuss their problems instead of fighting about them. But within twenty years, an even greater war, World War II, broke out. In spite of its failure, the League effort was useful in pointing the way to international cooperation. Some of its agencies still exist and are working at its headquarters in Geneva.

While World War II was still being fought, in 1941, President Roosevelt of the U.S.A. and Prime Minister Churchill of Britain signed the Atlantic Charter promising freedom for all peoples and a new world peace organisation after Hitler's Germany had been defeated.

Roosevelt and Churchill signed the Atlantic Charter promising freedom for all peoples.

The U.N. Charter

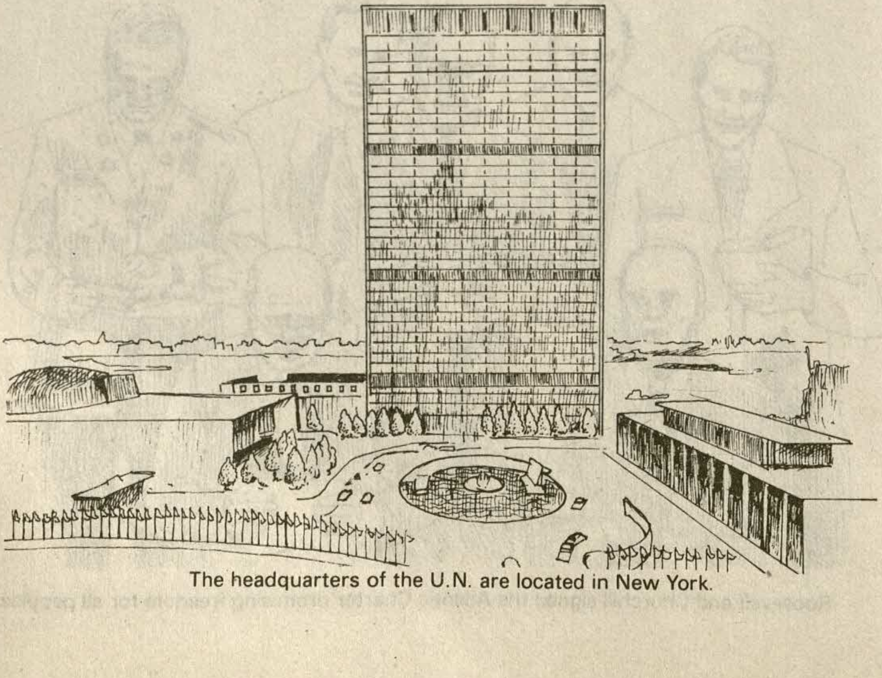
In 1945, towards the end of the war, representatives of 50 nations met in San Francisco and signed a United Nations Charter. The purpose of the U.N. is plainly stated in its preamble, which begins:

"We, the people of the United Nations, determined to save succeeding generations from the scourge of war ..... and to reaffirm faith in fundamental human rights, in the dignity and worth of the human person, in the equal rights of men and women and of nations large and small ....."

The existence of the U.N. has not stopped all wars. But because there is such an organisation, groups and countries are able to resort to other means of settling disputes as well. Very often, the U.N. has sent its own peace-keeping forces to see that fighting ends in this or that part of the world – in Korea and in Palestine, for example.

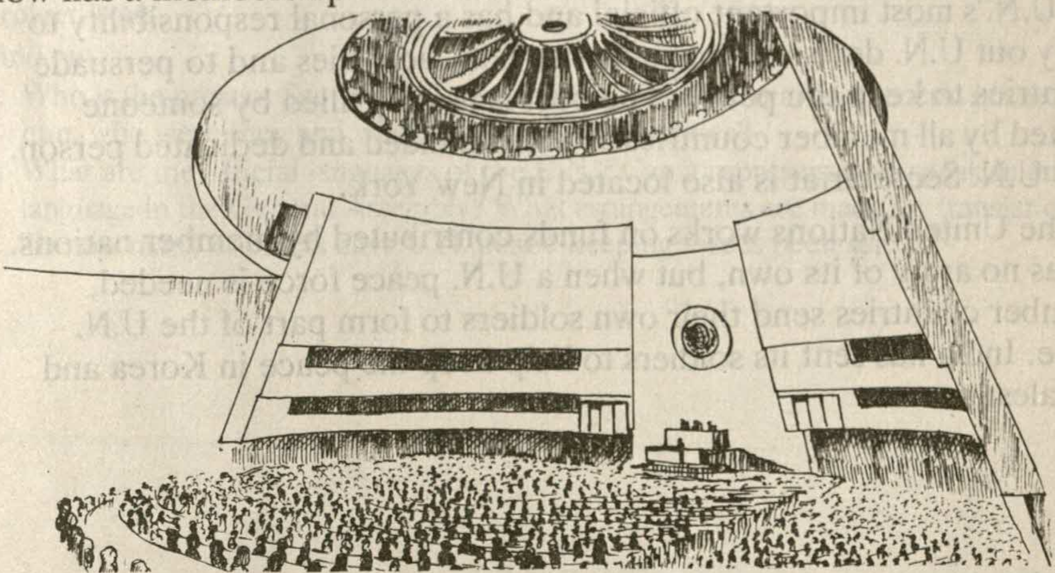
The General Assembly

The headquarters of the U.N. are located in New York. The General Assembly of the U.N. acts as a world parliament. It meets every year and has five representatives from each member state. Each member, however, has a single vote, so that all member nations are equal in the Assembly.



The headquarters of the U.N. are located in New York.

When the U.N. was first formed, the Western nations, under the leadership of the U.S.A. had a majority in the Assembly and exercised a decisive influence on its debates and actions. However, since then more and more Asian, African and South American nations have become independent and gained membership of the U.N. As a result, the most influential group in the General Assembly is now the non-aligned group of developing countries from Asia and Africa. (You will learn more about this group of nations in a later chapter.) The U.N. now has a membership of 158 countries.



The General Assembly acts as a world parliament.

The Security Council

The General Assembly is the forum for general discussions and debates. But when there is a crisis in any part of the world and an appeal is made to the U.N., a body called the Security Council meets to discuss the crisis and decide on the action to be taken. The Security Council has five permanent members — China, France, the U.K., the U.S.A. and the U.S.S.R. (These were the five victorious Allies of World War II.) There are ten other members of the Council who are not permanent. They are elected from among the other member nations of the U.N.

Whenever a vote on any possible action is taken in the Council, it is essential that the five permanent members should agree on the action.

If any one of them votes 'no' the action cannot be undertaken. This is called the 'veto' power. This has often caused problems and made the Council ineffective.

The Secretary-General

The decisions of the General Assembly and the Security Council are carried out by the U.N. Secretariat, working under the Secretary-General. The latter is appointed by the General Assembly after recommendation by the Security Council. The Secretary-General is the U.N.'s most important official and has a personal responsibility to carry out U.N. decisions, to supervise U.N. activities and to persuade countries to keep the peace. The post is usually filled by someone trusted by all member countries as a fair-minded and dedicated person. The U.N. Secretariat is also located in New York.

The United Nations works on funds contributed by member nations. It has no army of its own, but when a U.N. peace force is needed, member countries send their own soldiers to form part of the U.N. force. India has sent its soldiers to help keep the peace in Korea and in Palestine.

Exercises

1. Answer briefly:
   a. When was the League of Nations formed?
   b. Who signed the Atlantic Charter? What did it promise?
   c. How many countries sent representatives when the U.N. was formed? What is its membership now?
   d. What is meant by the 'veto' power? Which Security Council members hold this power?
   e. What is the most important position that an individual can occupy in the U.N.?
2. Fill in the blanks:
   a. After the Napoleonic wars there was an attempt, called the ____________ ____________, to convince the nations of ____________ that ____________ is better than war.
   b. The headquarters of the U.N. are located in ____________ ____________.

c. The __________ Assembly acts as a world __________. It meets every __________ and has __________ representatives from each __________ __________.

3. Give reasons why:
   a. The Western nations no longer have a majority in the General Assembly.
   b. The five permanent members of the Security Council are China, France, the U.K., the U.S.A. and the U.S.S.R.
   c. The Secretary-General has to be a fair-minded person.
   d. Indian soldiers were sent to Korea and Palestine.

Project work

Find out:

1. Who is the present Secretary-General; how many Secretaries-General preceded him, who were they and what were their nationalities?
2. What are the official languages of the U.N.? Can a representative speak in any language in the General Assembly? What arrangements are made for translation?
3. To how many conflicts have U.N. peace-keeping forces been sent?

16. U.N. agencies

To promote international cooperation in the political, economic and cultural spheres and to help member nations in various fields, there are several specialised U.N. agencies. When the U.N. was formed, it took over some older organisations like the International Telecommunications Union and the Universal Postal Union. The U.N. also took over agencies which had been founded by the League of Nations, like the International Labour Organisation (I.L.O.), the International Court of Justice and the Trusteeship Council.

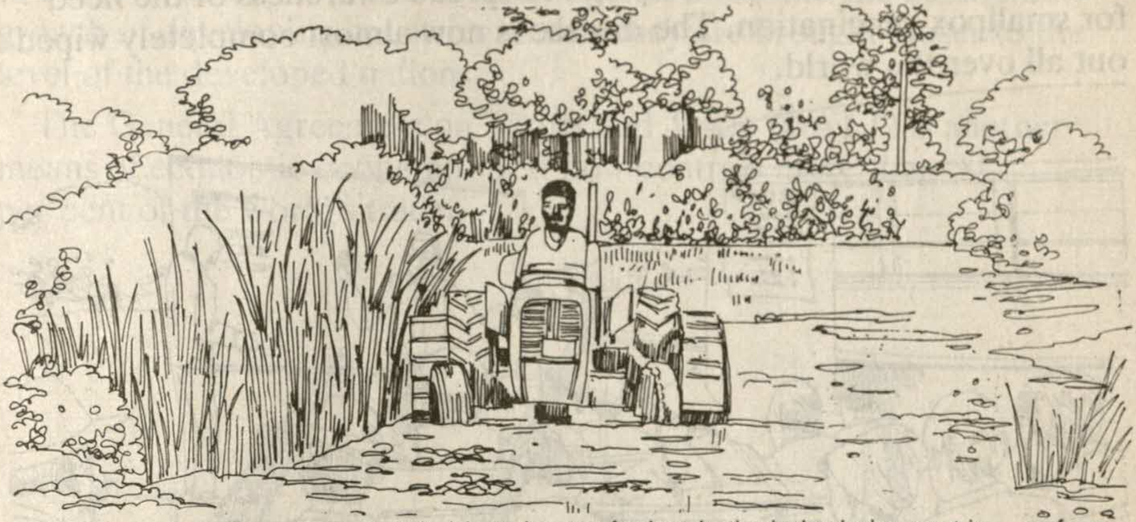
The ILO studies working conditions in various member nations. It provides advice and training to both government institutions and labour organisations. It also issues rules and guidelines regarding wages and working conditions, to improve the lot of workers everywhere. The ILO has two training centres, in Geneva, Switzerland and in Turin, Italy.

The International Court of Justice functions at The Hague in Holland, where it was first established by the League of Nations. Its judges are drawn from eminent jurists from all over the world and it hears disputes between nations under international law.

During the 18th and 19th centuries many countries of Asia and Africa were conquered and colonised by European powers. To help these countries to become independent in the 20th century, the League formed the Trusteeship Council. The Council considered the cases of several colonised countries and placed each under the 'trusteeship' of a developed and powerful country which was expected to help the colony become independent. Most of these former colonies are now independent, many of them through their own efforts. An exception is Namibia in South West Africa. This former German colony was placed in the 'care' of South Africa by the League, but the 'caretaker' has so far refused Namibia its freedom.

Food and Agricultural Organisation

This organisation, the FAO, was first formed in 1945, and brought under the U.N. after the war. It studies problems of world food production and advises members, especially developing countries, about improving production and distribution of food. Its work includes fighting plant diseases. It has its headquarters in Rome, Italy.

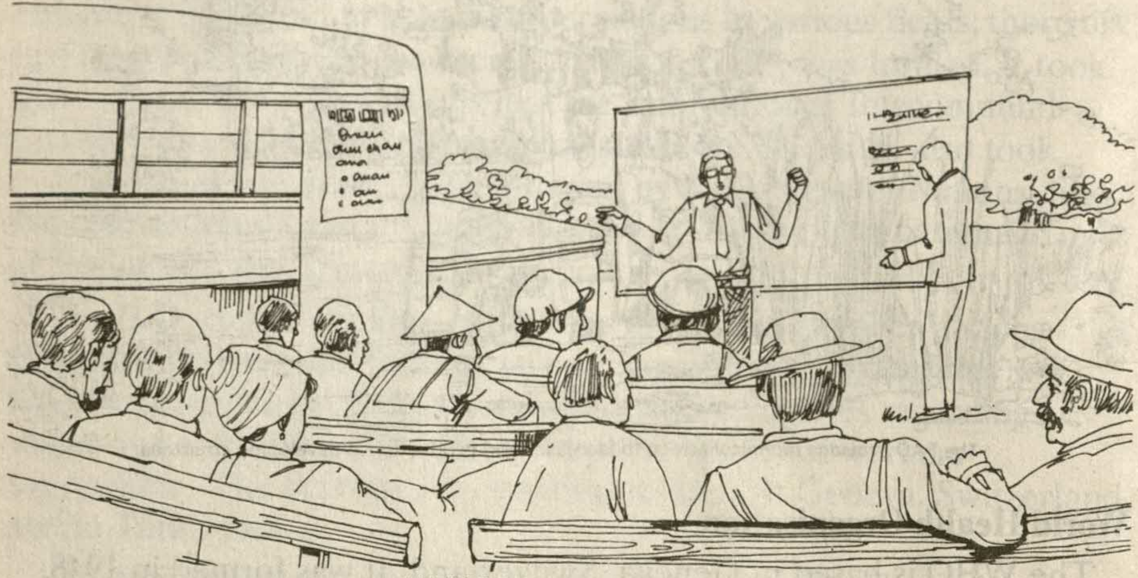

The FAO provides technical advice to increase food production in developing countries.

World Health Organisation

The WHO is based in Geneva, Switzerland. It was formed in 1948. It makes itself responsible for the study of epidemics like malaria and yellow fever. It provides information and aid against disease, especially to developing countries.

The WHO has helped eradicate smallpox.

One of WHO's most successful compaigns was conducted against smallpox. In all the countries where this terrible disease occurred, the organisation undertook a compaign to spread awareness of the need for smallpox vaccination. The disease is now almost completely wiped out all over the world.



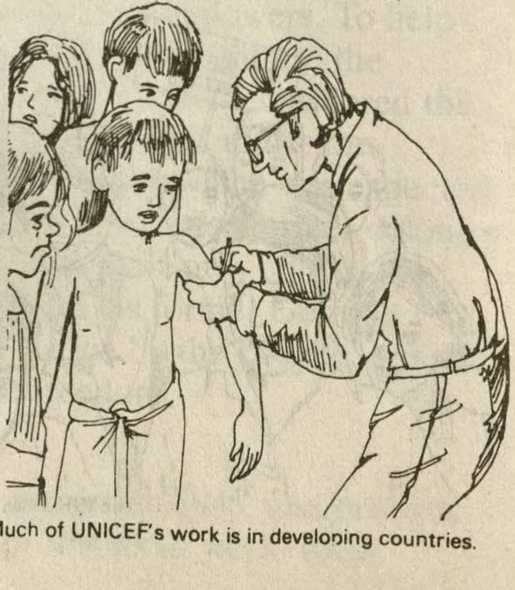
UNESCO helps remove illiteracy.

UNESCO

The United Nations Educational Scientific and Cultural Organisation works to improve educational standards in developing countries, remove illiteracy and provide free flow of scientific and cultural information between countries. Its offices are in Paris, France.

UNICEF

The UN Children's Emergency Fund arranges for health care, essential nourishment, education and training of children. Much of its work is in the developing countries. First established in 1946 to help child victims of war, it is based in New York, U.S.A.

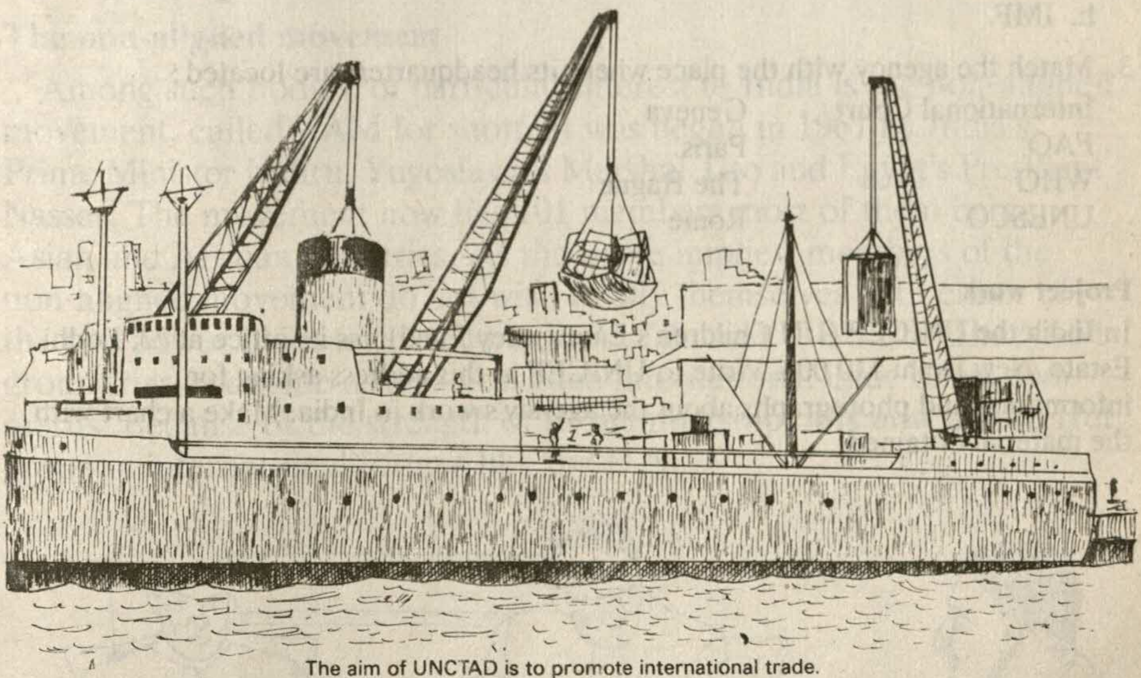


Much of UNICEF's work is in developing countries.

UNCTAD and GATT

The U.N. Conference on Trade and Development was established in 1964. Its aim is to promote international trade and the economic growth of developing countries so that they are brought closer to the level of the developed nations.

The General Agreement on Tariffs and Trade (GATT) is another means of economic cooperation. It now controls more than 80 per cent of the world's trade.



The aim of UNCTAD is to promote international trade.

The World Bank

The International Bank for Reconstruction and Development (IBRD) is usually known as the World Bank. It was established in 1946 and has its headquarters in Washington D.C., U.S.A. It gives loans to members for special development projects.

Some other U.N. organisations are the International Monetary Fund (IMF), the U.N. Environment Programme (UNEP), the U.N. Industrial Development Organisation (UNIDO) and the U.N. High Commission for Refugees (UNHCR).

Exercises

1. Answer briefly:
   a. Which are the U.N. agencies which existed even before the United Nations was formed?
   b. Where is Namibia situated? Why is it not yet independent?
   c. Which disease has WHO helped to wipe out?
   d. What is the function of the World Bank?
2. Give the full name of the following agencies and write a short paragraph about the work of each:

   a. ILO; b. FAO; c. WHO; d. UNESCO; f. UNCTAD; g. GATT; h. IMF.
3. Match the agency with the place where its headquarters are located:

International Court	Geneva
FAO	Paris
WHO	The Hague
UNESCO	Rome

Project work

In India the UNICEF (UN Children's Emergency Fund) has its office at 73, Lodhi Estate, New Delhi 110 003. Write to UNICEF at this address asking for information and photographs about the agency's work in India. Make a chart with the material obtained.

17. Other international organisations

The U.N. and its agencies are meant to include and serve as many nations of the world as possible. The U.N. stands for the freedom and equality of all countries but has no political ideology of its own.

Some nations have found it necessary and useful to have other organisations for cooperation among countries which have certain political, regional or economic factors in common.

The non-aligned movement

Among such bodies, of particular interest to India is the non-aligned movement, called NAM for short. It was begun in 1961 by India's Prime Minister Nehru, Yugoslavia's Marshal Tito and Egypt's President Nasser. The movement now has 101 members most of them being Asian and African countries. As the name implies, members of the non-aligned movement do not wish to ally themselves with either of the two power blocs (each led by the U.S.A. and U.S.S.R.). The NAM group tries to decide its stand on each international issue on its own merits. Because of the strength of its membership, it is now a powerful group in international forums like the U.N.

The founders of the non-aligned movement, Nehru, Tito and Nasser.

One of the results of the growing strength of NAM has been the formation of the non-aligned newspool. It is meant to provide member nations with news about each other and so bring about better understanding between them.

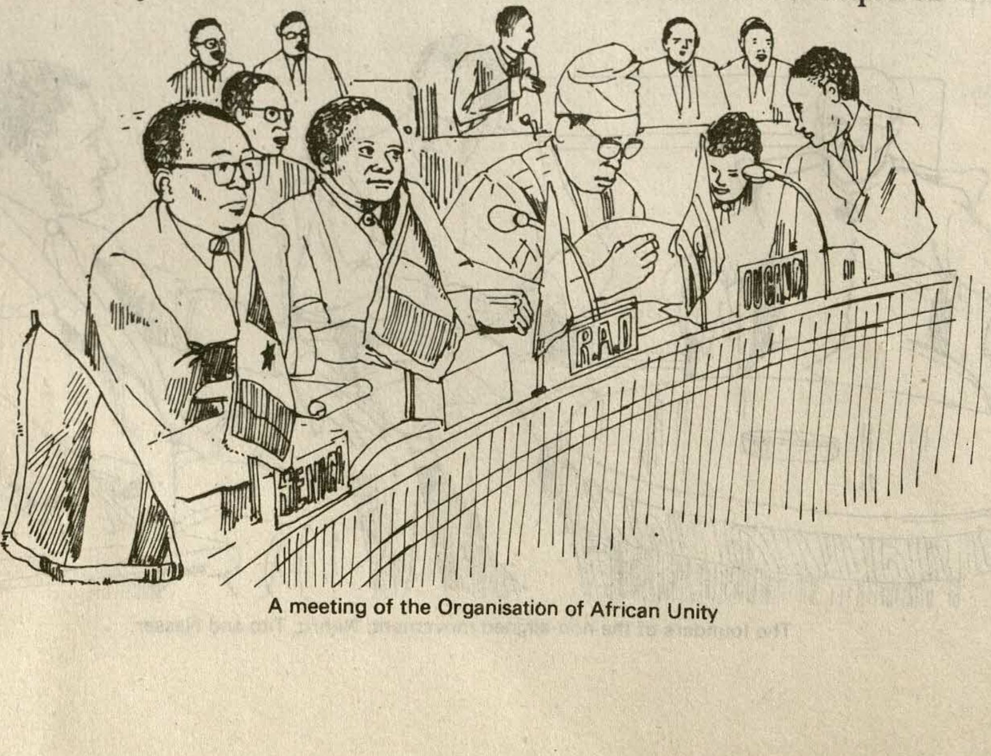
India is one of the most active members of the non-aligned movement.

The Organisation of African Unity

Known as the OAU, this organisation was formed in May 1963 by the leaders of 30 African countries. It now has a membership of 41. Its aims are unity and cooperation among African countries and opposition to colonialism. It has its headquarters in Addis Ababa, Ethiopia.

Fidel Castro addressing a non-aligned conference.

The OAU has very little power to actually do anything. But it provides a forum for African countries to find a common platform on certain issues. Members of the OAU are in agreement about opposing white-minority rule in South Africa. But there are other disputes in



A meeting of the Organisation of African Unity

Africa in which members of the OAU have taken opposing sides and the organisation has not been effective in any way.

Other organisations for regional cooperation in various parts of the world are the League of Arab States in West Asia, the Association of South East Asian Nations (ASEAN) and the Organisation of American States (OAS).

The Common Market

An important regional organisation is the European Economic Community (EEC) which is also known as the European Common Market. Based in Western Europe, it was formed in 1957 with six members. The membership has since increased to ten. There is a large degree of economic cooperation and planning in the EEC. The members have also formed the European Parliament for closer political ties.

East European countries also have an economic union, called Comecon, through which they cooperate in trade and industry.

The Commonwealth

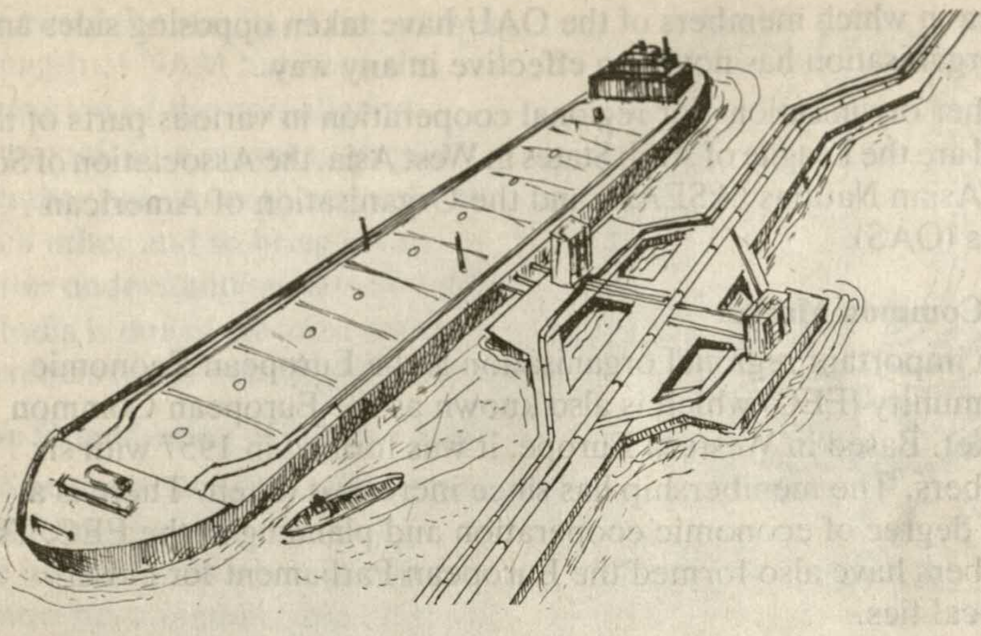
The British Commonwealth of Nations is formed by Britain and several of its former colonies. It is a free association of independent countries which helps members to cooperate for their mutual economic advantage. It now has more than 40 members, including India.

The French Community is similar to the Commonwealth. Its members are France and its former colonies.

Other organisations

Regional bodies for cooperative economic development include the Asian Development Bank (ADB) with headquarters in Manila, Philippines and the Colombo Plan group for South and South East Asia. India is a member of both groups.

The Organisation of Petroleum Exporting Countries (OPEC) is a group of 13 oil-producing states. Its aim is to protect members' interests in the world petroleum market and avoid competition among themselves. This is an economically powerful group, since petroleum is one of the most valuable commodities of the modern world.



An oil tanker: oil is one of the most valuable commodities of the modern world.

Military alliances

The above organisations are largely devoted to economic cooperation and development. But there are also organisations for 'mutual defence' which are military alliances. Chief among these are the North Atlantic Treaty Organisation (NATO) of western Europe and the USA, and the Warsaw Pact group of east Europe. International tension is quite often aggravated by hostility between such groups which makes the work of cooperation more difficult.

Exercises

1. Answer briefly:
   - a. Who were the founders of the non-aligned movement?
   - b. What is the purpose of the non-aligned newspool?
   - c. What is the OAU? When was it formed?
   - d. What do the British Commonwealth and the French Community have in common?
   - e. Name three international organisations, apart from the U.N., of which India is a member.

2. Fill in the blanks:
   a. Members of the ____________ movement do not wish to join either of the ____________ power ____________ .
   b. The Organisation of ____________ Unity was formed in ____________ . Its headquarters are in ___ _______ ____________ in Ethiopia.
   c. India is a member of the ____________ ____________ Bank and the ____________ plan group.

3. Give the full names of the following:
   a. EEC; b. OPEC; c. ADB; d. NATO; e. OAS; f. OAU;
   g. ASEAN; h. NAM.

Project work

Find out why South Africa is not a member of the Organisation of African Unity. What is the attitude of the OAU to South Africa?

18. Speech and writing

In the development of human beings from the primitive to the civilised certain discoveries and inventions have played a crucial part. The discovery and control of fire was one of these. The development of speech, the invention of written forms of communication, the invention of the wheel, agriculture and the domestication of animals, and barter or exchange of goods are among the important factors in the progress of mankind. In the next few chapters we will learn about some of these developments which were important to the growth of civilisation.

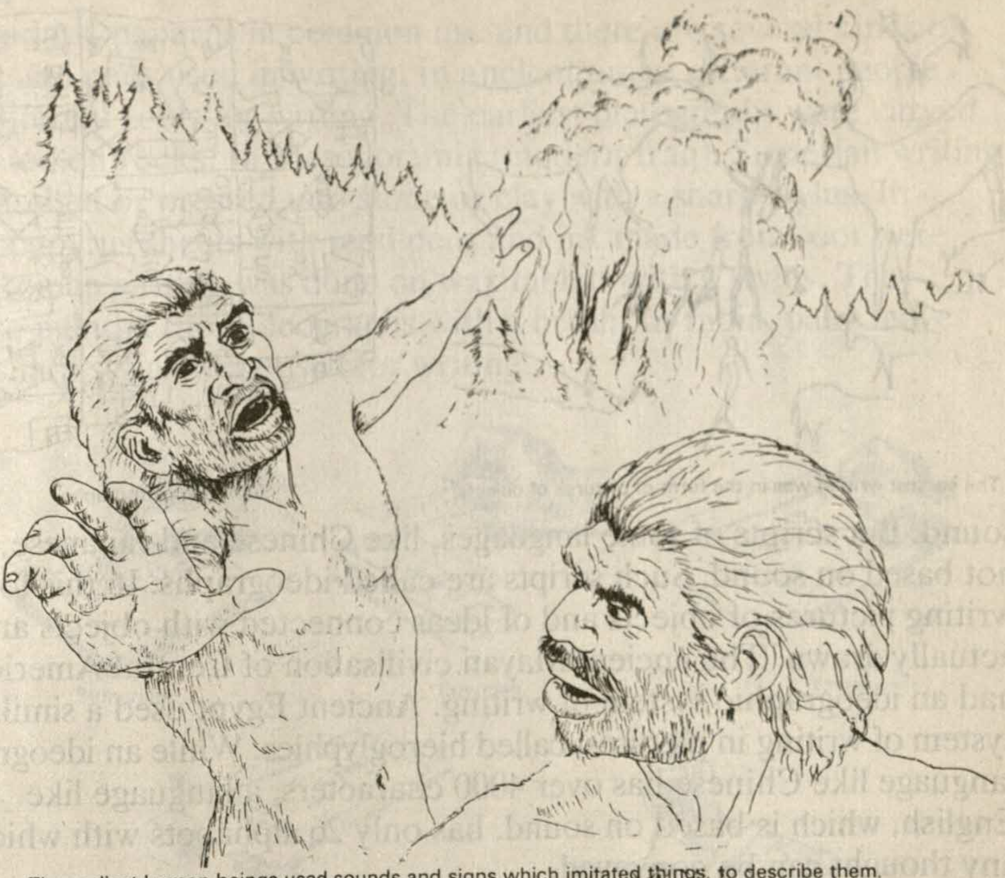
Communication is one of our most useful and necessary skills. Our ability to speak what is in our minds and write down our thoughts enables us to share facts and ideas with others. We communicate, in many ways now, with persons who are thousands of miles away.

Just as human beings communicate through speech and writing, animals communicate through sounds or peculiar movements of the body. A dog wags its tail when it is happy and barks when it sees a stranger. A cobra raises its hood when it is disturbed and angry. Similarly, every animal communicates its feelings through some kind of signal.

How did human language develop?

The earliest human beings must have made sounds like animals to convey their feelings. Through sounds and signs which imitated things, they would have tried to describe them. This is why, in most languages, we still have words that sound like the things they describe. Thus, over thousands of years, people learnt to give names to things, actions and feelings and so developed 'speech'. Today, there are many thousands of languages and dialects in the world.

There are similarities in the sound and meaning of words among languages of different regions. This is because most languages are



The earliest human beings used sounds and signs which imitated things, to describe them.

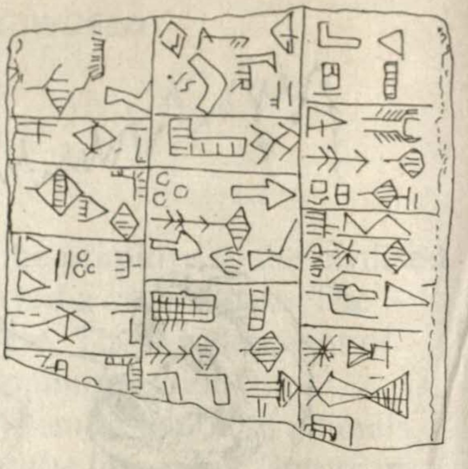
really branches of a few parent languages like Sanskrit or Latin. One can notice similarities in sound among Latin-based languages like Spanish, Italian and French. Sanskrit-based languages like Hindi, Bengali and Gujarati have a lot in common. There are also similarities between parent languages like Sanskrit and Latin.

Development of writing

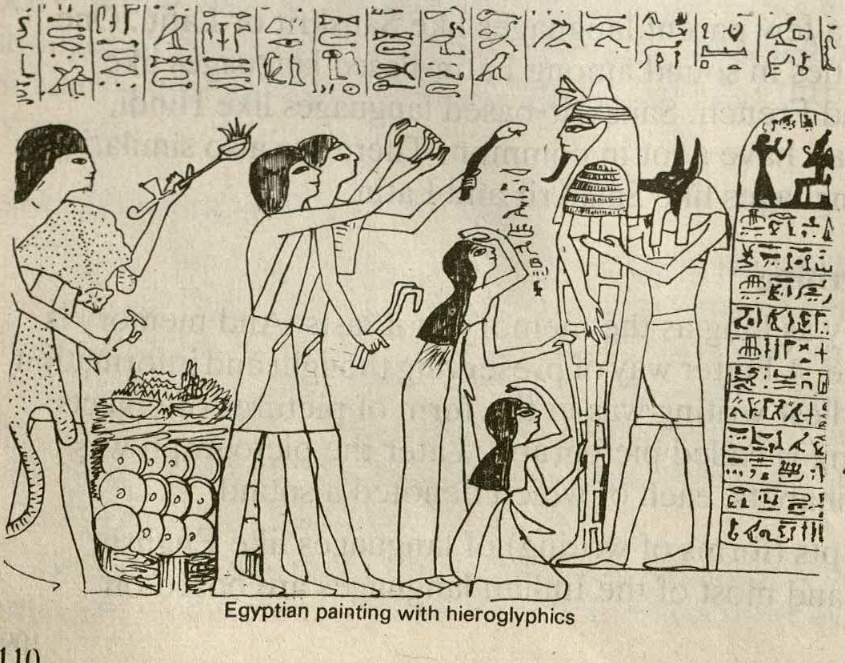
Speech lasts only as long as the memory of it lasts. And memory is not always accurate. A better way of preserving thought and information is writing. The earliest writing was in the form of pictures of objects. This form of writing is called pictograph. Later the pictograph was developed into alphabets, each of which denoted a sound.

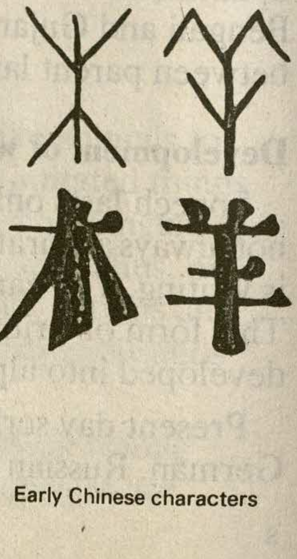
Present day scripts (forms of writing) of languages like English, German, Russian and most of the Indian languages are based on

The earliest writing was in the form of pictures of objects.


Sumerian pictographs

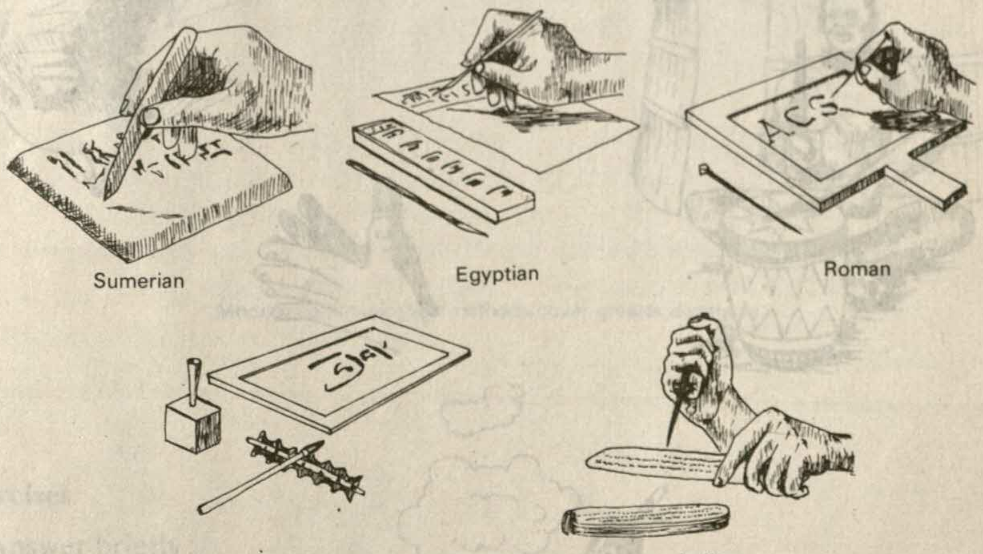
sound. But scripts of some languages, like Chinese and Japanese, are not based on sound. Such scripts are called ideographs. In this form of writing pictures of objects and of ideas connected with objects are actually drawn. The ancient Mayan civilisation of Central America had an ideographic system of writing. Ancient Egypt used a similar system of writing in pictures, called hieroglyphics. While an ideographic language like Chinese has over 4000 characters, a language like English, which is based on sound, has only 26 alphabets with which any thought can be conveyed.


Egyptian painting with hieroglyphics


Early Chinese characters

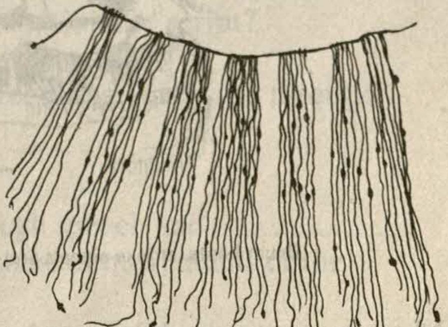
Writing tools

Nowadays, paper is in common use and there are several kinds of pencils and pens used in writing. In ancient times, different people used different tools for writing. The earliest pictographs were carved or painted on rocks. In Mesopotamia (modern Iraq), Sumerian writing was chiselled or pressed into stone or clay with a sharp stylus. In Egypt, papyrus sheets with reed pens and ink made from soot were used. Roman writing was done on wax tablets with a stylus. The Chinese painted their ideographs with a brush. In India, palm leaves and a sharp stylus were used for writing.


Sumerian
Egyptian
Roman
Chinese
Indian

Early writing tools

There have been and still are several languages which do not have a script. People speaking such a language sometimes developed other ways of preserving information. For example, the Incas of Peru did not have a written language. To keep records, they used a system of coloured knotted strings, called 'quipu'.

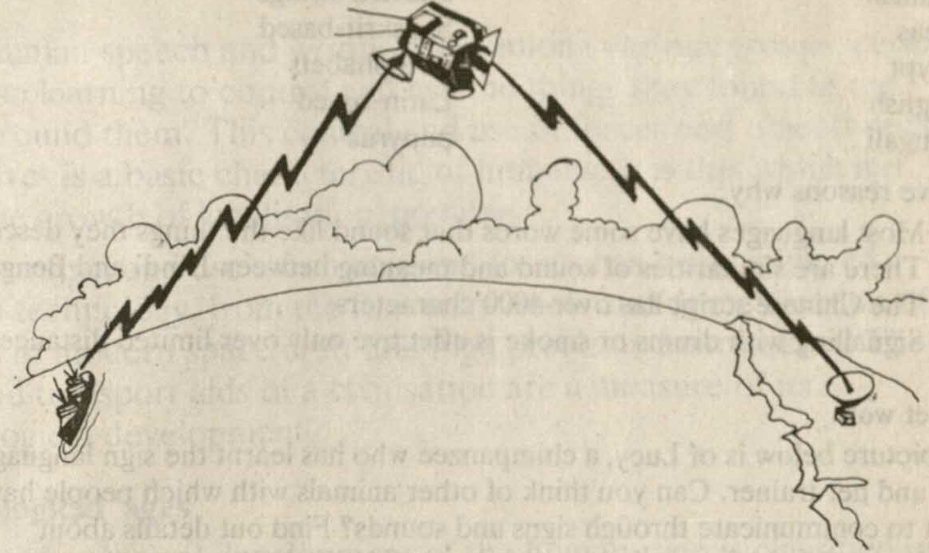

A quipu

From smoke signals to satellites

Closely related to language and written communication are other methods of sending information. In some primitive societies, messages were sent over limited distances through drum beats or smoke signals. In many societies it was known that pigeons could be trained to fly to specific places. Written messages were tied to their legs and they were set free to fly 'home'.

Drum beats, smoke signals and pigeons have all been used to send messages.

Modern communication methods cover much greater distances than could be traversed by drum beats, smoke or pigeons. Telegraph, telephone, radio and, finally, satellite communication have all speeded up the sending of messages around the globe and even into space.



Modern communication methods cover greater distances.

Exercises

1. Answer briefly:
   a. Name three discoveries or inventions that have been crucial to the progress of civilisation.
   b. How did the earliest human beings communicate with each other?
   c. How does the English script differ from the Chinese script?
   d. Name three writing tools of ancient times.
   e. What sense organ would be involved in receiving a message through
      i. drumbeats; ii. smoke signals?

2. Fill in the blanks:
   a. Just as human beings ____________ through speech and ____________, ____________ communicate through sounds, or movements of the ____________.
   b. Speech lasts only as long as ____________ lasts. A better way of preserving thought and ____________ is through ____________.

3. Match columns A and B:

A	B
Spanish	knotted strings
Incas	Sanskrit-based
Egypt	26 alphabets
English	Latin-based
Bengali	papyrus

4. Give reasons why:
   a. Most languages have some words that sound like the things they describe.
   b. There are similarities of sound and meaning between Hindi and Bengali.
   c. The Chinese script has over 4000 characters.
   d. Signalling with drums or smoke is effective only over limited distances.

Project work

The picture below is of Lucy, a chimpanzee who has learnt the sign language of the deaf, and her trainer. Can you think of other animals with which people have learnt to communicate through signs and sounds? Find out details about experiments in which people have tried to 'talk' to dolphins and chimpanzees. What is the extent to which dogs can understand human speech?

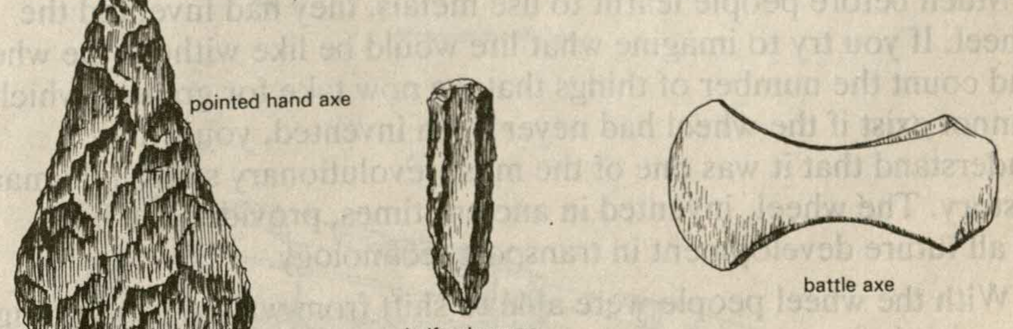
19. The development of technology

While human speech and writing grew among various groups, people were also learning to control and use the things they found in the world around them. This control and use of forces and objects outside themselves is a basic characteristic of humans. It is this which has made the growth of 'civilisation' possible.

The 'control and use' of objects and forces has been achieved through technology, from the first stone tools and domestication of animals to modern space craft and high precision instruments. The tools and transport aids of a civilisation are a measure of its technological development.

Technological 'ages'

The technological development of the human race is classified into 'ages' depending on the material used during a particular period for the making of tools and other objects. The first of these technological ages was the Stone Age, when stone, usually flint, was chipped and shaped to make knives, axes, hammers and other tools and weapons.



Stone was chipped and shaped to make tools and weapons.

The discovery of metals and their use brought people forward out of the Stone Age into the successive metal ages of copper, bronze and iron.

The knowledge that metals could be heated and shaped into any desired form led to their use in many areas — as tools, as weapons and armour, as ornaments and images.

Copper statue from the Indus Valley

Hittite soldiers with metal armour and weapons

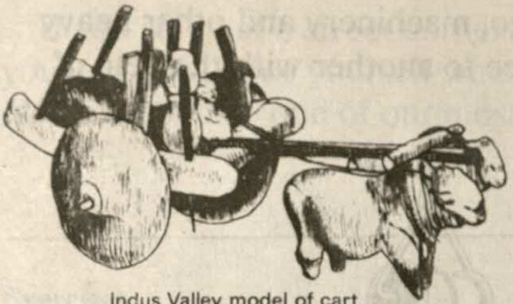
Metals could be heated and shaped to make images and ornaments, tools, weapons and armour.

The wheel

Much before people learnt to use metals, they had invented the wheel. If you try to imagine what life would be like without the wheel and count the number of things that we now take for granted which cannot exist if the wheel had never been invented, you will understand that it was one of the most revolutionary steps in human history. The wheel, invented in ancient times, provided the basis of all future development in transport technology.

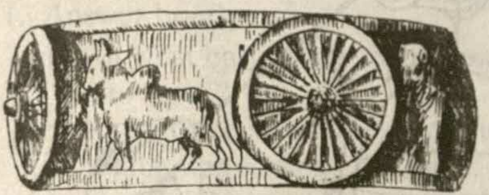
With the wheel people were able to shift from walking and riding on animals to carts and chariots. The use of metals to strengthen wooden wheels made it possible to make vehicles that could carry greater loads over longer distances. It also improved the speed and endurance of vehicles. An extension of the invention of the wheel was its use in the pulley which helped people lift heavy loads.

In the modern world, wheels and pulleys play a very important role in our day-to-day life. Buses, trains, cars, aeroplanes — almost all

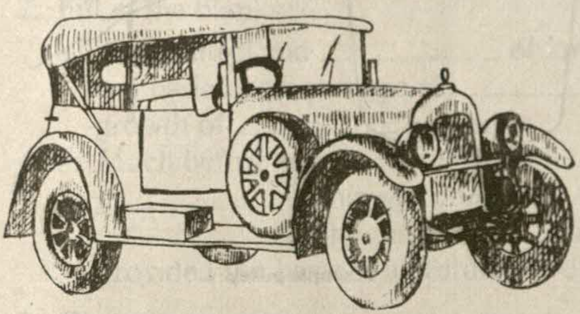


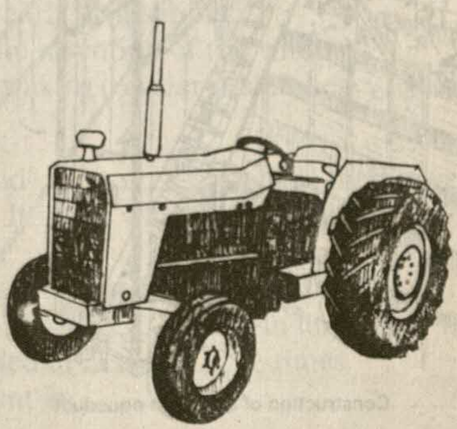
Indus Valley model of cart

Gold model of Persian chariot

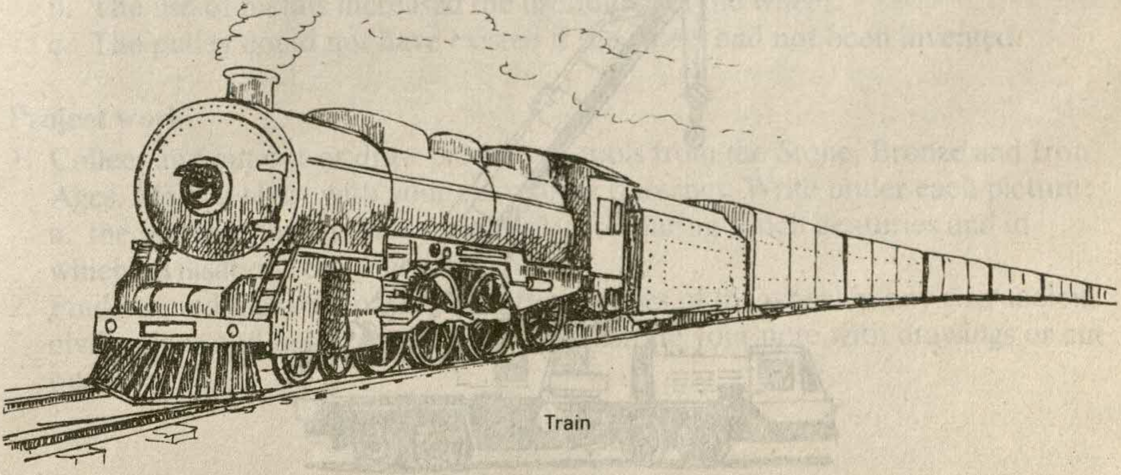


Symbolic wheel in Asoka pillar





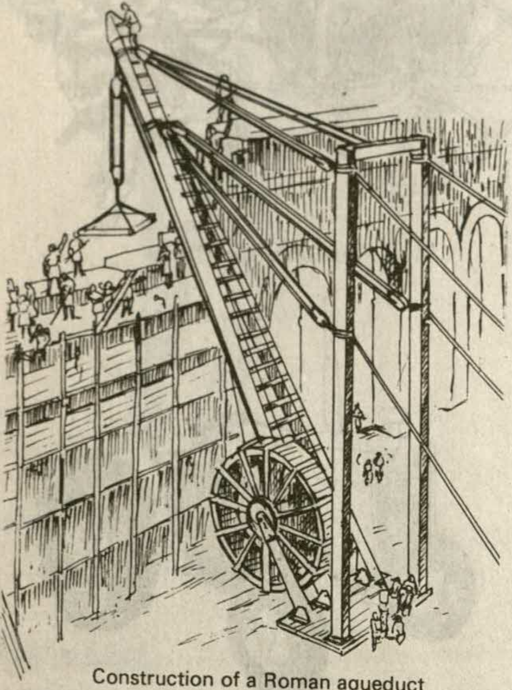
Motorised vehicles



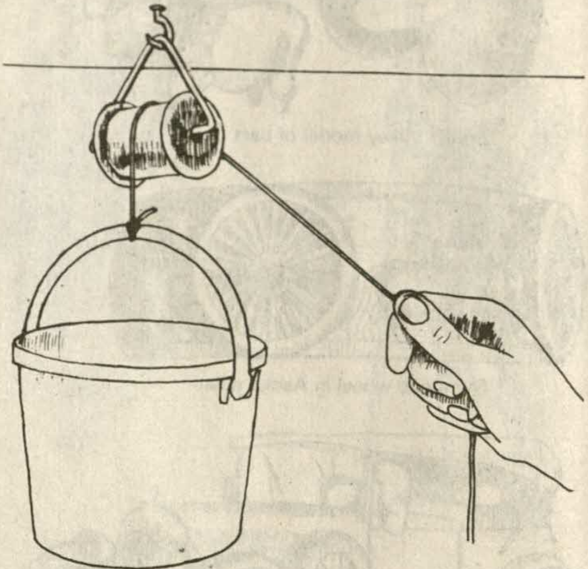
Train

The wheel provided the basis for all future development in transport technology.

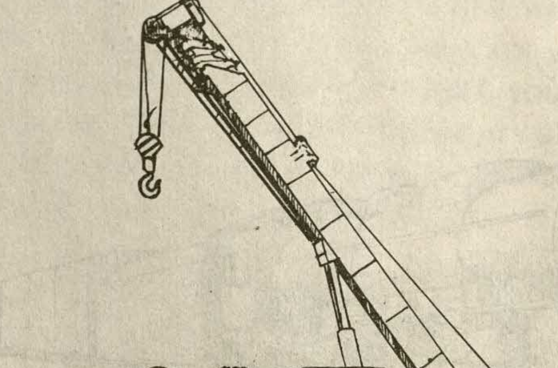
types of vehicles move on wheels. Cargo, machinery and other heavy loads are shifted or lifted from one place to another with the help of pulleys fitted to cranes.



Construction of a Roman aqueduct



A simple pulley



A crane

The use of the wheel in the pulley helps to lift loads.

If you stand at a street corner and watch the vehicles going past, you can decide for yourself whether the wheel, one of our earliest ideas, is not also one of our most useful and important inventions.

Exercises

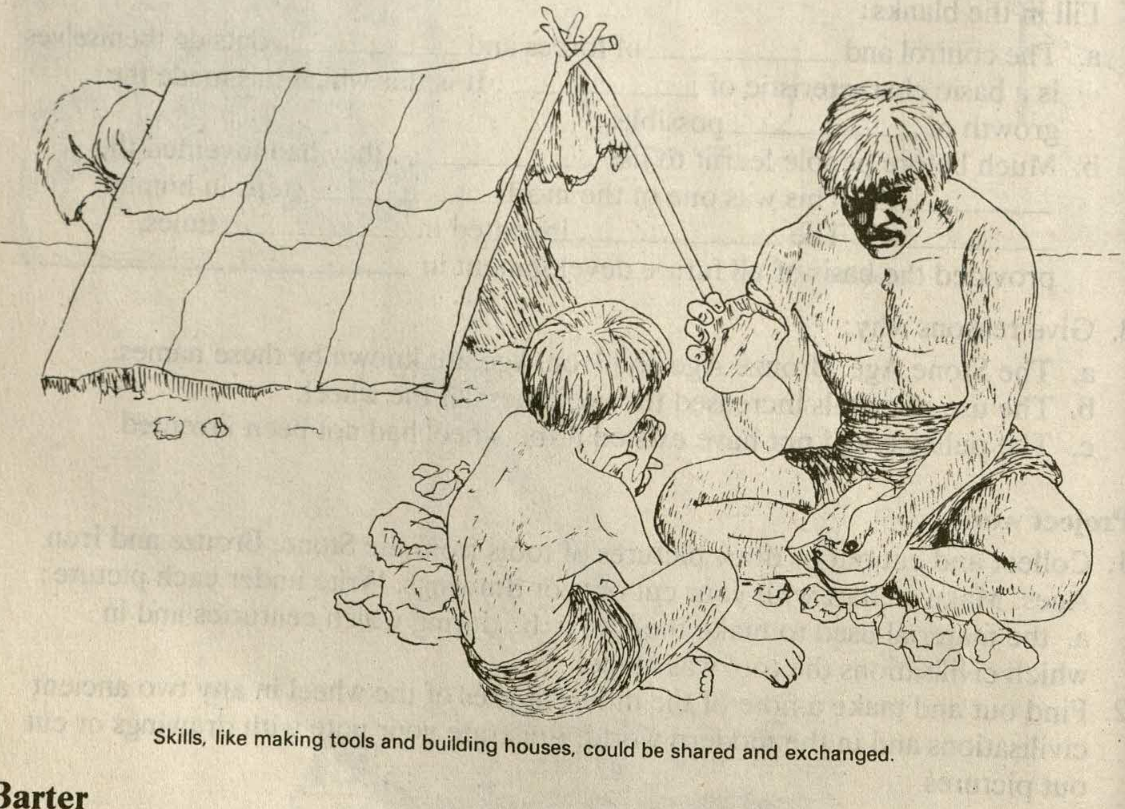
1. Answer briefly:
   a. On what basis is the technological development of the human race classified into 'ages'?
   b. Name three areas of use for metals in the early civilisations.
   c. Which was earlier: the use of metals or the invention of the wheel?
   d. How did the invention of the wheel help in making it easier to shift heavy loads?
2. Fill in the blanks:
   a. The control and __________ of forces and __________ outside themselves is a basic characteristic of __________. It is this which has made the growth of __________ possible.
   b. Much before people learnt to use __________, they had invented the __________. This was one of the most __________ steps in human __________. The __________, invented in __________ times, provided the basis of all future development in __________ __________.
3. Give reasons why:
   a. The Stone Age, Bronze Age and Iron Age are known by these names.
   b. The use of metals increased the usefulness of the wheel.
   c. The pulley could not have existed if the wheel had not been invented.

Project work

1. Collect and cut out or draw pictures of tools from the Stone, Bronze and Iron Ages. Make a chart with your cut outs or drawings. Write under each picture:
   a. the material used to make the tool; b. during which centuries and in which civilisations the tool was made.
2. Find out and make a note of the different uses of the wheel in any two ancient civilisations and in the modern world. Illustrate your note with drawings or cut out pictures.

20. Buying and selling

Even before people exchanged ideas, they were exchanging ‘things’ to satisfy their needs. One person may have had a lot of fruit and another an excess of firewood. They could both satisfy their needs by exchanging fruits for firewood. Similarly, they could exchange skills and help each other in many ways. If one could build a house better than another, this skill could be exchanged for some other skill like making tools and implements. If one could cook well and the other could hunt well, they could get together and share their abilities to satisfy each other’s needs. They could also exchange skills for goods. This was the natural beginning of trade, of cooperation and of employment.



Skills, like making tools and building houses, could be shared and exchanged.

Barter

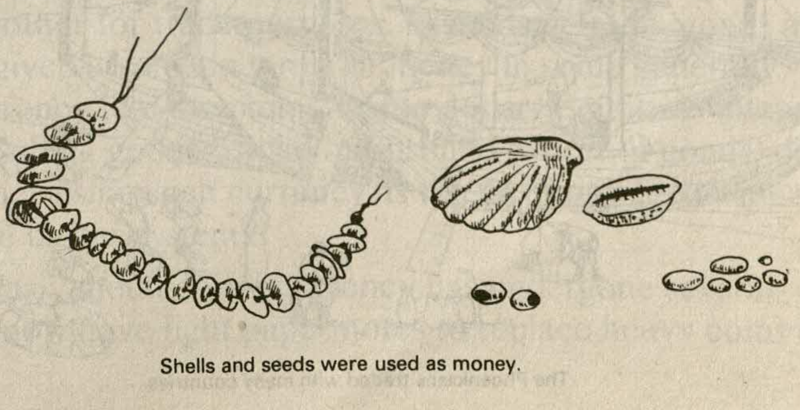
People of early times, having only limited skills to help them in activities like crop growing, hunting for food, building shelters and defending themselves against other people and against wild animals, found that they could improve their lives by exchanging what they had in excess for what was scarce. This is called 'barter'. If you give your friend a pencil sharpener in exchange for a colour pencil, you are 'bartering' in the same way as the early people did.

If you exchange a pencil sharpener for a colour pencil, you are 'bartering'.

Money

When people settled down to a more organised life, their needs increased and diversified. They required goods or commodities that were not easily available or which came from distant places. This was how trade began. After a while, the value of different commodities was counted in terms of one single commodity which was used as a standard for comparison. This was the beginning of 'money'.

In early times, many different things were used as money — shells, coloured seeds and metals like gold and silver. Scarce commodities



Shells and seeds were used as money.

like salt were also used as money in many places. The word 'salary' derives from the Latin word 'salarium' meaning 'salt money'.

Gradually, people began to make coins out of metals and use them as a medium of exchange. With this, the concept of 'currency' took shape and people could buy and sell things in exchange for money.

Phoenician shekel

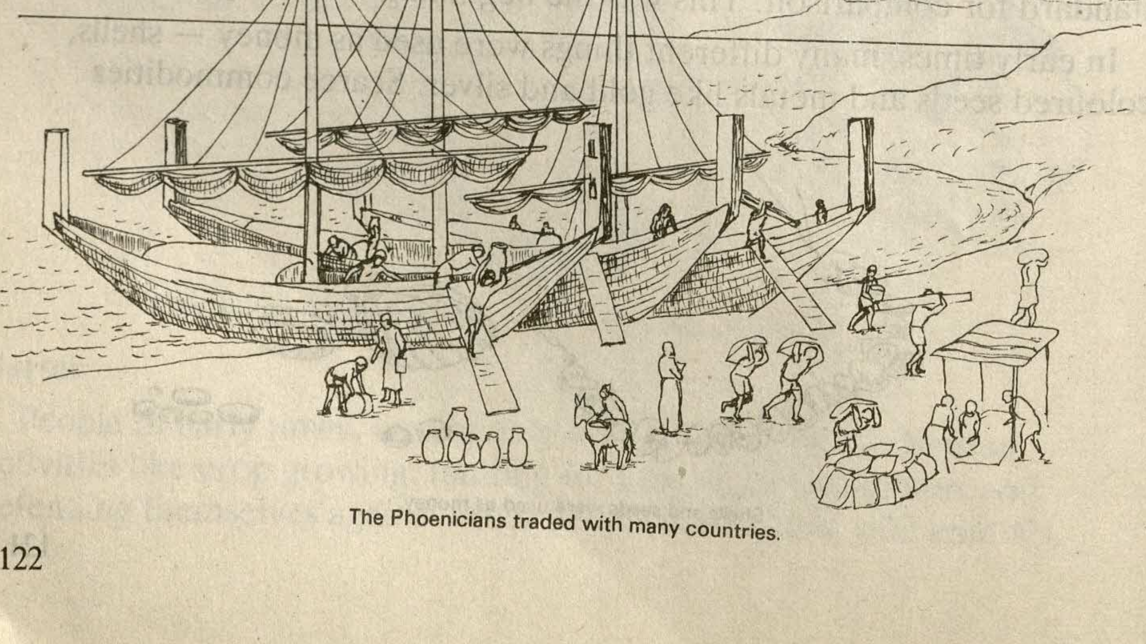
Carthaginian coin

Roman coin

People began to make metal coins.

The growth of trade

Side by side with the development of currencies, trade also grew and developed. During the age of barter, exchange of goods first took place between individuals and between family groups. Later, this simple exchange grew into 'trade' when exchange took place over distances and goods had to be transported from place to place.


The Phoenicians traded with many countries.

From the time of some of the early developed civilisations, people of one civilisation often knew about goods which were the special product of some other distant civilisation. Merchants made long journeys over land and by sea for trade. The earliest contacts between the Asian civilisations of India and China and the European civilisations of Greece and Rome were through trade.

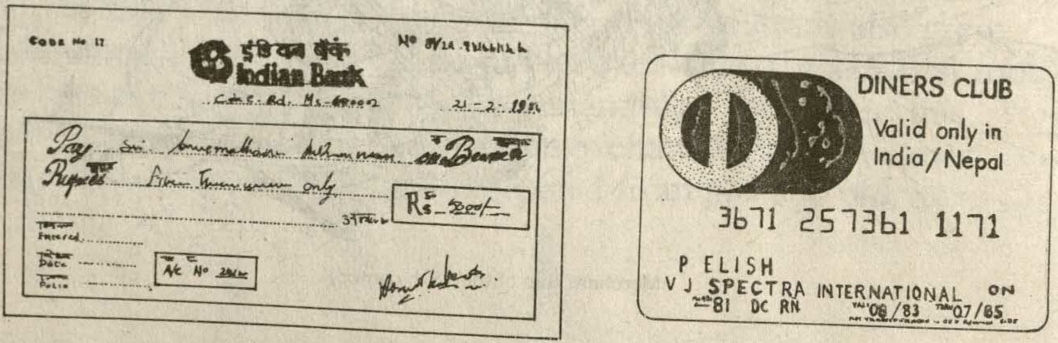
Merchant ship of the 18th century

Currency systems

Both trade and currency systems are today part of a very complicated international network. Currencies of different countries are valued against each other for trade purposes. In modern trade, goods and services are given a value in terms of money in some generally accepted currency like the pound or the dollar. Countries interested in buying or selling goods (called import and export of goods) deal with each other using such currency as the medium of exchange. This eliminates the barter system.

From the early metal coins, currency has undergone several changes. We now have light paper notes to replace heavy coins of high value. Even paper notes can now be substituted by a single piece of paper, the 'cheque'. A further development in currency is the credit card which entitles the holder to buy goods or services on credit and pay later. In dealings at the international level the SDR (Special Drawing Right) of the International Monetary Fund has itself gained the status of a currency.

paper note



cheque

credit card

Currency has undergone several changes.

All these forms are money because they represent a value for which goods and services can be bought and sold. They are an easy way to trade without having to carry a large sackfull of commodities looking for someone who needs them and who can give you something you need in exchange.

However, besides the complicated currency and trade systems of the modern world, the barter system still exists in the rural areas of some developing countries and among certain primitive tribes.

Exercises

1. Answer briefly:
   a. Define 'barter'.
   b. How did the concept of 'money' develop? Name some early forms of money.
   c. What is the origin of the word 'salary'? Explain.
   d. Name four different forms of currency that exist today.

2. Fill in the blanks:
   a. When people settled down to a more __________ life, their needs increased. They required goods or __________ that were not easily __________ or which came from distant __________. This was how __________ began.
   b. In early times, many different __________ were used as money: __________, coloured __________ and metals like __________ and __________. Scarce __________ like salt were also used as __________ in many places.
   c. From the time of some of the early developed __________, people of one __________ often knew about __________ which were the special product of some other distant __________. The earliest contacts between the Asian civilisations of __________ and China and the __________ civilisations of Greece and __________ were through trade.

3. Tick the correct sentences. Correct those that are incorrect:
   a. Buying goods for money payment is called barter.
   b. Shells and coloured seeds were among the earliest types of money.
   c. Modern trade and currency systems are very simple and straightforward.
   d. The first contact between Europe and Asia was the invasion of India by a Greek army.
   e. The barter system no longer exists.

Project work

Find out:

1. The meaning of the 'gold standard'.
2. The names of the currencies of West Germany, France, Spain, Brazil, Canada, Egypt, Nigeria, Japan and Bangladesh.
3. The difference between a cheque and a credit card and what is required before you can get each of them.

21. Philosophers and scientists

From time to time, in the history of the world, have lived persons who have contributed greatly to human knowledge or human well-being. They have been of many different nationalities and have worked in different areas – philosophy, science, medicine, art, politics and discovery. But they have in common the fact that their lives have been useful and valuable to all people. In thought or action, they have led the way into the unknown so that others may follow. They are the 'pathfinders'.

In ancient India, the sages and rishis who gave us the Vedas and Upanishads were the pathfinders of Hindu philosophy. In China, in the sixth century B.C., there lived a man called Confucius. He was the son of a government official but, since his father died when he was a child, Confucius had to earn his own living early in life. However, he educated himself at the same time and soon became well known as a teacher.

The teachings of Confucius

Even while he was running a school for the young men who came to study under him, Confucius was working as a government official. He gained a reputation for honesty and ability in his work and when he was older, was made Chief Justice and, later, Prime Minister, of the State of Lu in China. But his honesty and strictness made him many

Confucius

enemies and he had to leave Lu. He travelled all over northern China, gathering large groups of students to listen to his teachings wherever he went.

Confucius saw that greed and selfishness were the cause of much of the evil in the world. He taught people to lead a better life through honesty and through doing their duty. He laid down rules for persons in their private and public relationships. The basis of his teachings was that each person was responsible for the quality of his or her own thought and action.

Socrates

In the western world Socrates, of the Greek city of Athens, is regarded as the first great philosopher. He lived in the fifth century B.C. and followed his father's trade as a stone-cutter. In his youth he also served in the army for a few years.

Even as a young man Socrates developed the habit of asking questions. He spent his spare time in the public places of the city where people of all walks of life gathered round him to listen to, or take part in, the discussions he conducted. Socrates earned a great name as a teacher but he did not try to teach by telling people what was right. He taught by asking questions which made people think and find the answer for themselves. When one question was answered he would ask another, and then another, so that his listeners understood how careful and continuous is the search for truth.

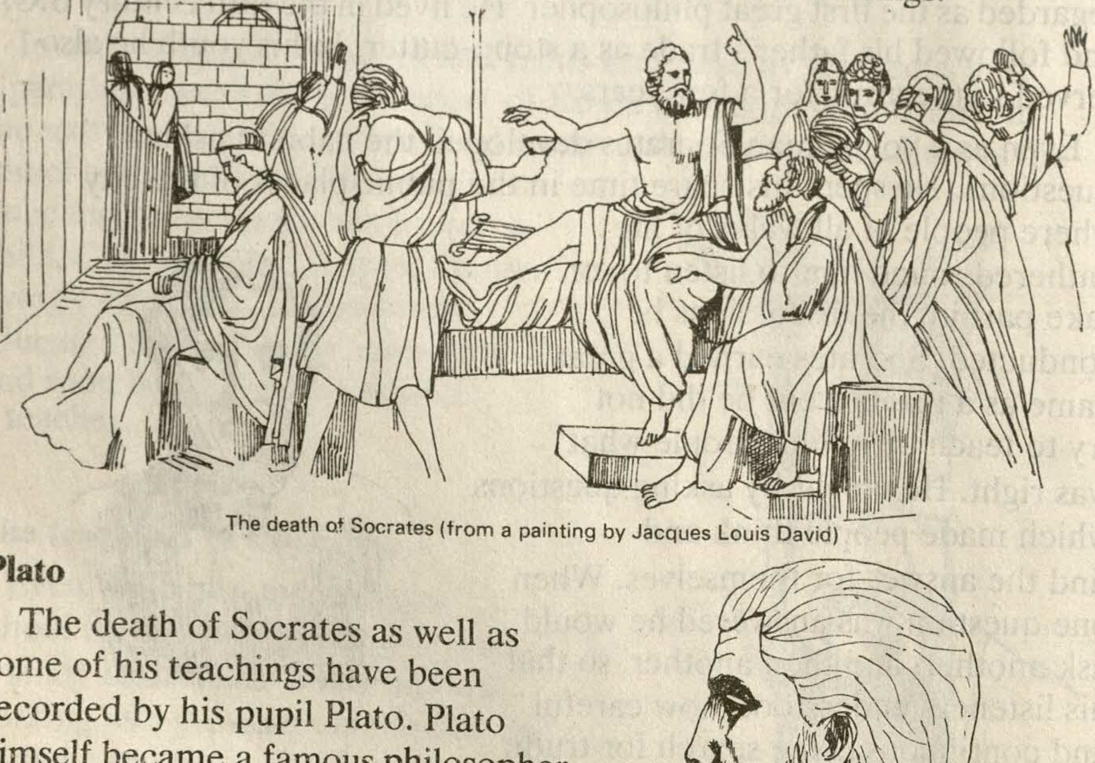
Socrates

As time went on, Socrates made enemies among some of the professional teachers who resented the fact that so many young people found a conversation with Socrates more interesting than their own classes. They also disliked him because he did not accept payment for his teaching.

Though he had been questioning and teaching for most of his life, it was only when Socrates was nearly seventy that his enemies found enough support among those in power to have him arrested. He was accused of misleading the young men of the city and destroying their faith in the gods.

Socrates denied the charge and spoke bravely of the need to search for truth instead of blindly accepting the teachings of others. He was found guilty and condemned to die.

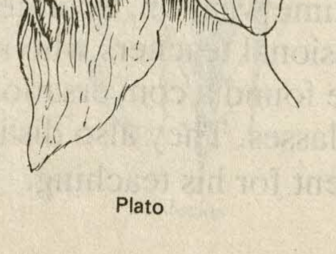
While Socrates was in prison his friends offered to help him escape but he refused. When he was brought a cup of poisonous hemlock he drank it without protest and died bravely. In his life and death Socrates established the value of truth above all other things.



The death of Socrates (from a painting by Jacques Louis David)

Plato

The death of Socrates as well as some of his teachings have been recorded by his pupil Plato. Plato himself became a famous philosopher and teacher. He established a school called the lyceum, for young men of good family. Plato thought and wrote much about the nature of men and of governments. He came to the



Plato

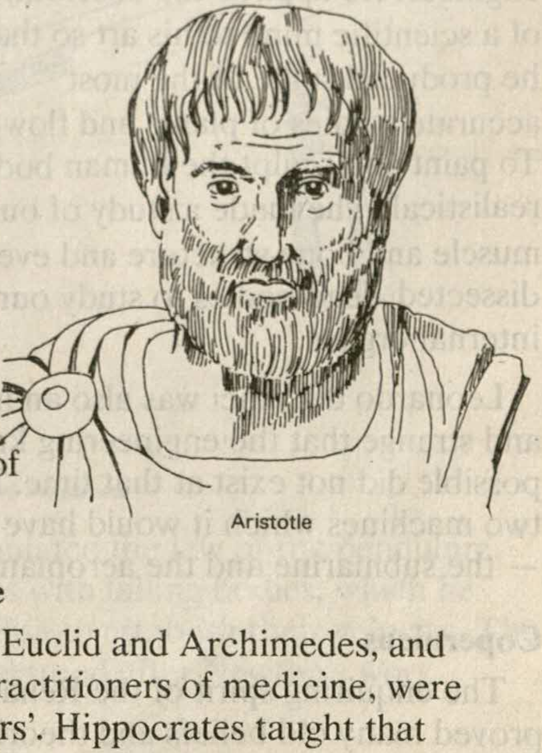
conclusion that the best form of government is one in which the ruler is a 'philosopher-king'. His most famous book, 'The Republic' explains his ideal of the philosopher-king.

Aristotle

Plato's pupil Aristotle was not only a philosopher, but also a scientist. He lived in the fourth century B.C. Aristotle believed in learning through observation and experiment. He recorded in detail his observations of various living things which he divided into two categories, plants and animals. He also sub-divided animals according to whether they lived on land, sea or in the air. Through his studies, Aristotle found out a great deal about the anatomy of animals.

Aristotle also developed specific theories about the nature of the universe. He wrote a number of books on various subjects like politics, ethics and astronomy. His work in several fields was accepted as the whole truth for several centuries in Europe. Though he was later proved wrong in many of his ideas such as that the earth is the centre of the universe, he was much ahead of his age in knowledge. He was, above all, a man of reason who demonstrated the value of patient observation in the study of any subject.

As a teacher, Aristotle was given the opportunity to train a philosopher-king. He was the tutor of Alexander the Great.



Aristotle

From the Greeks to the Renaissance

The mathematicians, Pythagoras, Euclid and Archimedes, and Hippocrates, one of the first great practitioners of medicine, were among the ancient Greek 'pathfinders'. Hippocrates taught that medical treatment should be scientific and should not depend on magic or religion.

In the western world, it was the Arabs who followed the Greeks as students of science, especially in mathematics and chemistry. In Europe, the Christian Church did not encourage scientific progress for several centuries, insisting that the doctrines accepted by the Church were the only true ones in all fields.

During the fifteenth century there spread over Europe a new spirit of enquiry, which led to a sudden increase in knowledge and discovery, and produced great works of art and literature. This period in European history is known as the 'Renaissance'.

Leonardo da Vinci

One of the men of genius of this age was Leonardo da Vinci (1452-1519). He was an Italian painter, sculptor, musician, architect, scientist and engineer. He applied the observation of a scientific mind to his art so that he produced some of the most accurate studies of plants and flowers. To paint and sculpt the human body realistically, he made a study of our muscle and bone structure and even dissected dead bodies to study our internal organs.

Leonardo da Vinci

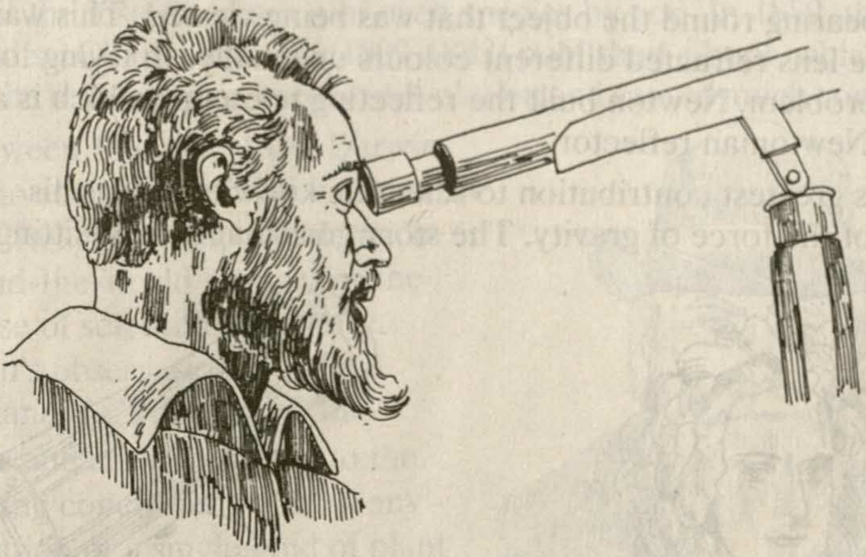
Leonardo da Vinci was also an inventor whose ideas were so new and strange that the engineering knowledge to make his inventions possible did not exist at that time. His sketch books contain designs of two machines which it would have been quite impossible to build then — the submarine and the aeroplane.

Copernicus

The enquiring spirit of the Renaissance led to discoveries which proved many old beliefs and theories to be wrong. In astronomy, Copernicus put forward the theory that the earth was not the centre of the universe but that the earth and other planets moved round the sun.

Galileo

In the early seventeenth century, two scientists, the German Johann Kepler and the Italian Galileo Galilei (1564-1642), made discoveries which proved that Copernicus was right. A few years earlier the telescope had been invented by a Dutch spectacle maker. Understanding the principle of the telescope, Galileo built his own improved instrument and observed the heavenly bodies. He discovered four of Jupiter's moons (they are now referred to as the Galilean moons), and also found that Venus had 'phases' like the moon. He also observed details about the surface of the moon. From his observations he concluded that the earth, Venus, Jupiter and the other planets moved round the sun and that some of these planets had moons moving round them.



Galileo viewing the planets

As a young man Galileo had formulated the law of the pendulum. His other work included experiments with falling bodies, which he dropped from the leaning tower of Pisa to establish their velocity. The results he obtained were better understood after Newton's work on gravity.

Despite the proofs offered by Galileo that the planets moved round the sun, the Church refused to give up the old beliefs. Because the

Church was then powerful enough to decide what people should believe, he was arrested and forced to deny the truth of his own discoveries.

Kepler

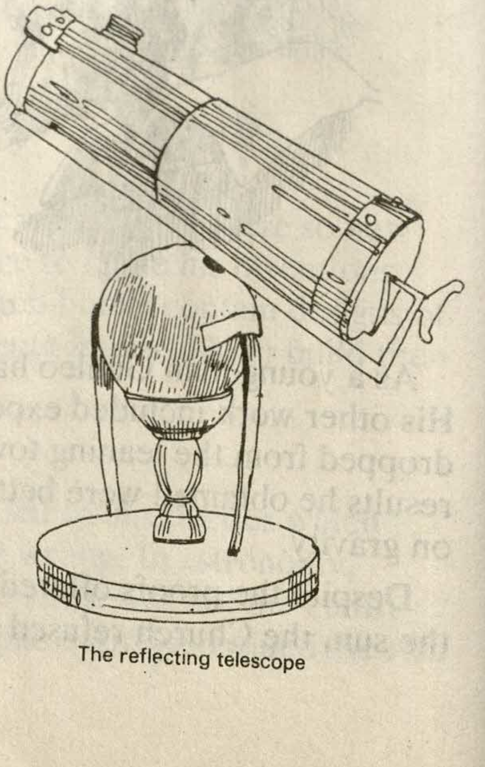
Kepler found out that the paths of the planets round the sun are elliptical or oval in shape. From this he worked out his laws of planetary motion.

Newton

The work of Isaac Newton (1642-1727) helped further to explain the nature of the universe. He studied sunlight and showed that it was made up of the colours of the rainbow. This band of colours is called the 'spectrum'. At that time, all telescopes were marred by coloured fringes appearing round the object that was being viewed. This was because the lens refracted different colours unequally. In trying to solve this problem, Newton built the reflecting telescope which is also called the Newtonian reflector.

Newton's greatest contribution to scientific knowledge was his discovery of the force of gravity. The story goes that he was sitting

Isaac Newton



The reflecting telescope

under an apple tree when a fruit fell down on him. He may have picked up the apple and eaten it. But he also thought about why the apple should fall down and not up and why anything should move towards anything else. He conceived the theory that there was a force of attraction between objects, not just on earth, but in the whole universe. For twenty years he worked out the mathematics of such a force and then announced his discovery. Today we send rockets into space and space-craft to other planets, knowing exactly how the other planets will influence them through their gravitational force.

Darwin

Old beliefs about the nature of the universe were overturned by the astronomers of the 16th and 17th centuries. But beliefs about the animal world and the origin of human beings were still based on the idea of the instant creation of each species by god. In 1859, the British naturalist, Charles Darwin (1809-1882) published a book which set forth the revolutionary theory of evolution and caused much controversy.

Between 1831 and 1836, Darwin had travelled as the official naturalist of the 'Beagle', a ship which made a round-the-world voyage for the purpose of scientific discovery. Darwin's observation of animal and plant life, both during the voyage and afterwards, led to the following conclusion : that in any population of a single kind of plant or animal, those who possess certain favourable characters are more likely to survive than others. The survivors will hand on these characteristics to their young and this will cause an evolutionary change by which all of that kind will finally have the favourable characteristics.

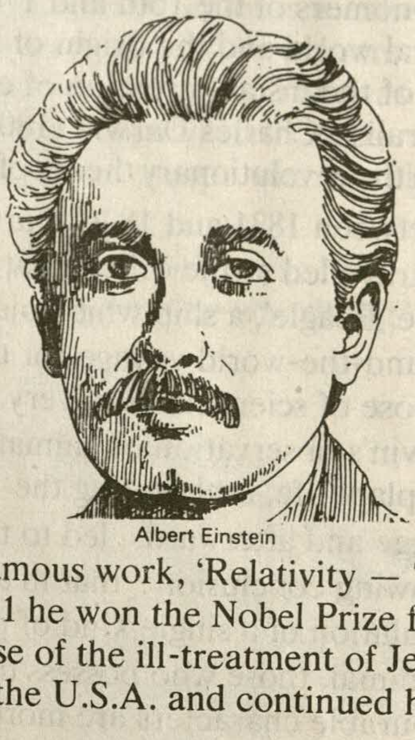
Charles Darwin

The book which Darwin published in 1859 to explain his theories was called 'Origin of Species by Means of Natural Selection'. The method of natural selection described by Darwin is also referred to as the 'survival of the fittest'.

Darwin's theory of evolution caused a great deal of controversy because it went against the teachings of the Church and because it helped establish that people and apes were descended from a common ancestor who lived long ago.

Einstein

After Newton, the greatest contribution to knowledge in the physical sciences came from Albert Einstein (1879-1955). Einstein was born into a German-Jewish family. He was a poor student at school because he could not adapt himself to a method of education which required students to learn facts by rote. He believed that education should be about ideas rather than facts. He was expelled from school but his mathematics teacher gave him a certificate saying that his studies in that science were far in advance of what was required. This enabled him to continue his education.



Albert Einstein

Einstein studied at the University of Zurich in Switzerland and later taught there as professor of physics.

In 1920 Einstein published his most famous work, 'Relativity — The Special and the General Theory'. In 1921 he won the Nobel Prize for Physics. In 1933 he left Germany because of the ill-treatment of Jews by the Nazis under Hitler. He settled in the U.S.A. and continued his work at Princeton University.

Einstein's theory of relativity showed that time, space and matter are interrelated and interdependent. His theory has provided the basis of a great deal of modern research in mathematical physics.

Einstein was known not only for his genius as a scientist but also for his humane qualities — his compassion and his lack of pride. He was deeply concerned about the evils of society, oppression and the destruction caused by war.

During the Second World War, Einstein supported the making of the atomic bomb by the U.S.A. But later, seeing the destruction it could cause, he regretted his support for the project.

Exercises

1. Answer briefly:
   a. What were the basic principles of the teachings of Confucius?
   b. Describe the teaching method adopted by Socrates.
   c. How did Socrates die?
   d. What, according to Plato, is the best form of government?
   e. Who was Aristotle's most famous pupil?
   f. Who was the first astronomer to say that the earth was not the centre of the universe? Who proved it?
   g. What was Newton's greatest discovery?
   h. Who formulated the theory of evolution? What is the title of the book in which the theory was explained?
   i. What did Einstein's theory of relativity demonstrate?
   j. Why did Einstein leave Germany to live in the U.S.A.?

2. Fill in the blanks:
   a. In the western world __________ of Athens is regarded as the first great __________. He lived in the __________ century B.C. and followed his father's trade as a __________. In his youth he also served in the __________ for a few years.
   b. The mathematicians Pythagoras, __________ and __________, and the doctor Hippocrates were among the ancient __________ pathfinders. __________ taught that medical treatment should be scientific and should not depend on __________ or __________.
   c. As a young man Galileo had formulated the law of the __________. He also experimented with __________ bodies which he dropped from the __________ of Pisa to establish their __________.
   d. Darwin's theory of __________ was controversial because it went against the teachings of the __________ and because it established that __________ and apes were descended from a common __________.

3. Match columns A and B:

A	B
Confucius	The Republic
Plato	taught Alexander the Great
Socrates	voyage of the 'Beagle'
Aristotle	moons of Jupiter
Leonardo da Vinci	Chinese teacher
Galileo	Nobel prize
Darwin	designed aeroplane
Einstein	asked questions

4. Tick the correct sentences. Correct those that are incorrect:
   a. Confucius worked as a government official even while he conducted a school for young men.
   b. Socrates was a successful teacher because he gave long lectures to his students.
   c. Aristotle wrote and taught about political philosophy and was not interested in any other area of study.
   d. The Renaissance was a period when there was a new spirit of enquiry in Europe.
   e. Leonardo da Vinci dissected dead bodies because he was interested in medical research.
   f. Kepler worked out the laws of planetary motion.
   g. Darwin's theory of natural selection was also referred to as the 'survival of the fittest'.
   h. Albert Einstein lived and worked in Germany throughout his life.

5. Give reasons why:
   a. Socrates had to drink the poisonous hemlock.
   b. Galileo denied the truth of his own discoveries.
   c. Darwin's theory of evolution was controversial.
   d. Einstein was a poor student in school.

Project work

You have learnt something about some of the great philosophers and scientists of the world. Find out something about the life and work of:

1. Ptolemy the second century astronomer and geographer;
2. Tycho Brahe, the Danish astronomer;
3. William Herschel.

Write a note on the contribution of each to the progress of astronomy.

22. Inventors

When Leonardo da Vinci designed a 'flying machine', even he may not have thought it possible that it could actually be built and made to work. There must have been many persons who had such ideas ahead of their time. But there have been many more to whom the idea for an invention occurred at a time when it was possible to make it work.

The invention of printing

In the 15th century, there lived in Germany a man whose invention speeded up the spread of knowledge throughout the world. Until that time books had to be carefully copied by hand. You can imagine how much time was needed to make each copy. Since very few copies of any book could be made, very few people could learn to read and write.

Early in the 15th century the idea of printing with wooden blocks had been brought from China to Europe. Each page of writing and pictures would be carved on a block of wood, the block would be inked and pressed on a sheet of paper. This was better than copying by hand but it was still clumsy and expensive.

Then the German Johann Gutenberg invented the movable type. He cut a mould for each letter and poured molten lead into the mould. Thus he could make as many types of each letter as he wanted and use these types to set and print the pages of any book.

An early printing machine with movable type

Gutenberg's invention was taken up by William Caxton of England who set up a printing press in London. The pioneering work of Gutenberg and Caxton made printing easier, faster and less expensive.

This helped in the spread of knowledge and of education and contributed to the Renaissance in Europe.

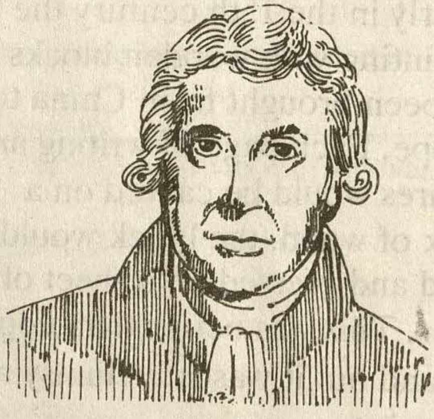
The Industrial Revolution

In the 18th century there began in England a revolution that did not involve fighting or killing. This was the Industrial Revolution. Over a short span of time several inventions greatly changed methods of manufacture and of transport. Trade increased as more goods were produced. The Industrial Revolution completely changed the economic life of England and later of other Western countries.

One of the basic causes of the Industrial Revolution was the invention of the steam engine. It was first invented by Thomas Necomen to work the pumps used to pump water out of coal mines. The first steam engines were large, unwieldy and used up much fuel.

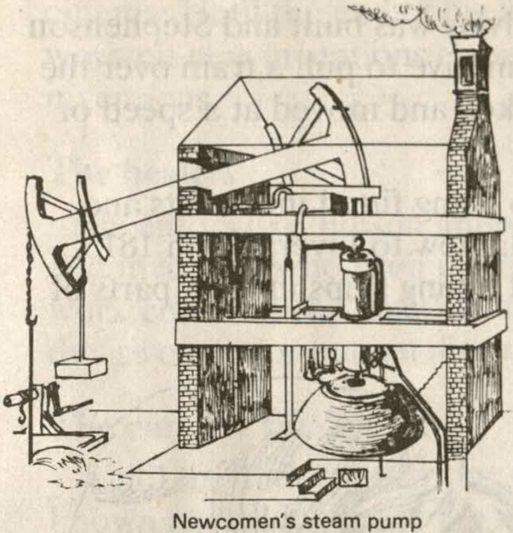
James Watt's engine

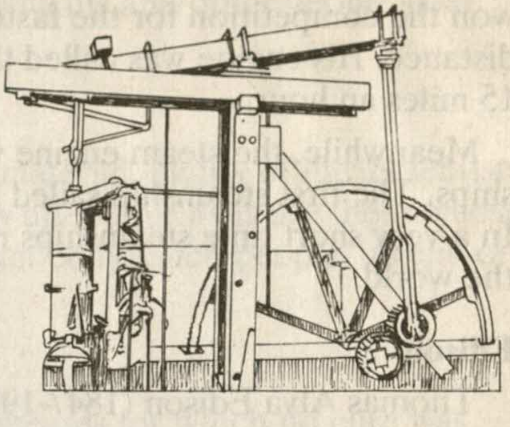
In 1763 one of Newcomen's engines was brought to an instrument maker called James Watt for repairs. Watt (1736-1819) had already thought about the possible use of steam power. It is said that even as a young boy he had watched a kettle lid jumping as the water boiled and realised that it was the power of steam that was making it jump.


James Watt

When Watt was asked to repair Newcomen's engine he studied it carefully and decided to improve on it. After two years' work he produced an engine which did not have the drawbacks of Newcomen's engine. He had invented the separate condenser which became an essential part of the steam engine.

With a partner, Watt set up a factory for steam engines in Birmingham. While producing pumping engines for mines and mills, he began to design a steam engine which would make a wheel turn. In 1793 he built an engine which could drive moving as well as stationary machines.

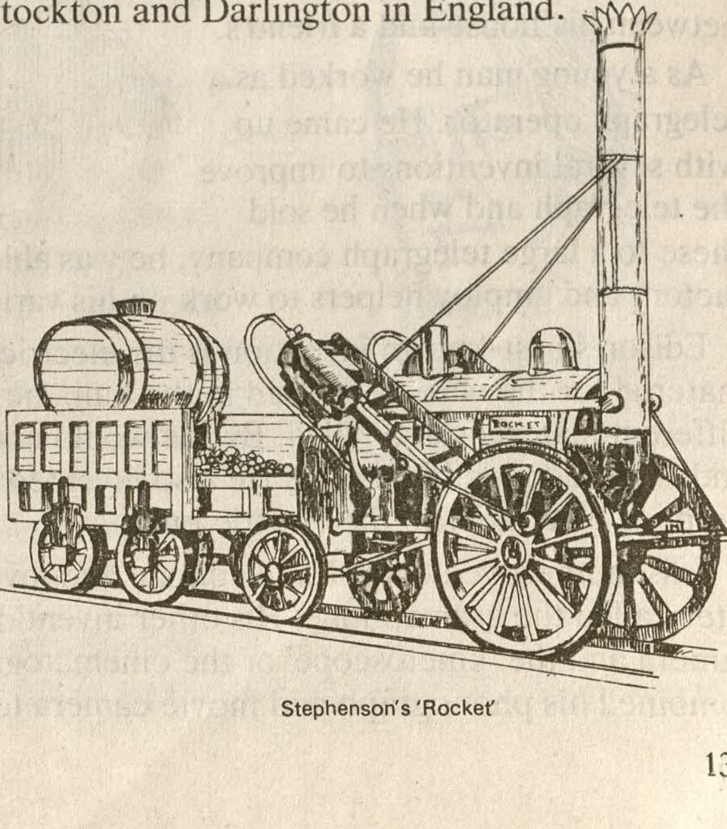

Newcomen's steam pump


Watt's steam engine

Stephenson's locomotive

The next great step in the use of steam power was taken by George Stephenson, a worker in a coal mine near Newcastle. In the mine a stationary engine was used to pull coal trucks up a slope with a rope. Stephenson thought a moving engine would be more efficient and in 1815 he invented one. He then went on to build the first railway engine, to run between Stockton and Darlington in England.

George Stephenson



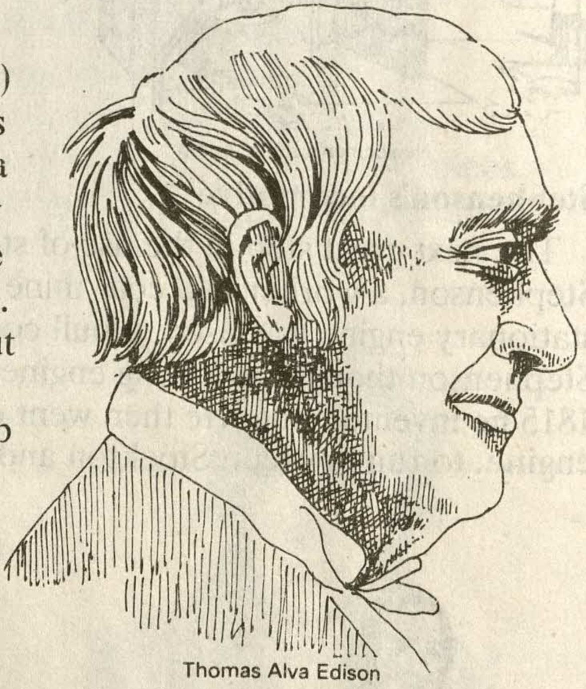
Stephenson's 'Rocket'

In 1829 the Liverpool Manchester Railway was built and Stephenson won the competition for the fastest locomotive to pull a train over the distance. His engine was called the 'Rocket' and moved at a speed of 15 miles an hour.

Meanwhile, the steam engine was also being fitted into boats and ships. The first steamship sailed from Glasgow to Liverpool in 1815. In a very short time steamships replaced sailing ships in most parts of the world.

Edison

Thomas Alva Edison (1847-1931) was an American whose inventions number over a thousand. Even as a small boy he was interested in how things worked and very early made up his mind to become an inventor. He was a poor student at school but was always experimenting with electricity or a telegraph line set up between his house and a friend's.


Thomas Alva Edison

As a young man he worked as a telegraph operator. He came up with several inventions to improve the telegraph and when he sold these to a large telegraph company, he was able to set up his own factory and employ helpers to work on his various inventions.

Edison's best-known invention is the electric bulb. To find the right material for the wire to be used in the bulb, he tried over a thousand different materials and failed. But he would not give up and, in the end, succeeded in his search. He also invented the dynamo which supplied electricity to the electric bulb.

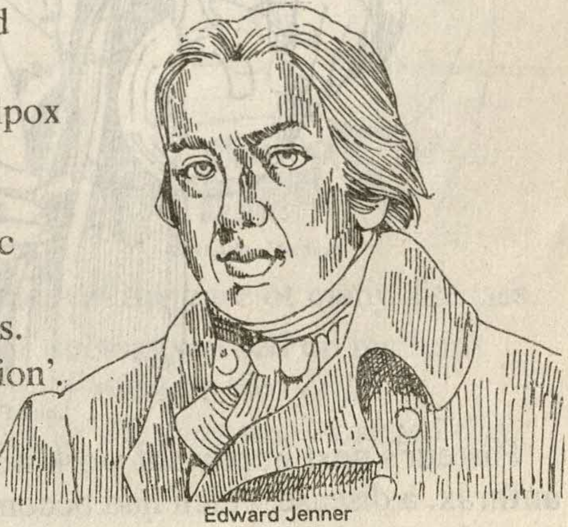
Edison improved on Bell's telephone and invented the 'phonograph', later called the gramaphone. His other inventions include the movie camera and the 'kinetoscope' or the cinematograph. He himself later combined his phonograph and movie camera to produce the talking cinema. Until the end of his life, at the age of 84, Edison continued to work on new inventions or on improving his and other people's old inventions.

The healers

Inventors like Edison improve the material quality of life. Scientists and inventors who even more directly affect our lives are those whose work concerns the health of the human body. Such people 'invent' or devise cures for human illness.

The cure for smallpox

Until the 18th century one of the diseases for which no cure was known and which caused many deaths, was smallpox. Edward Jenner (1749-1823) was an English doctor who thought about and carefully studied all the facts that could be gathered about this disease. One of these facts was that a person who had recovered from an attack of smallpox would never have it again. He also found that people who worked with cows, like milkmaids, often had a milder illness called cowpox. But once they had suffered from cowpox they were also immune to smallpox. Jenner worked on the problem for thirty years, examining many cases of both smallpox and cowpox. After a while he deliberately gave people cowpox when there was a smallpox epidemic and found that this saved them from getting the more serious illness. This was the beginning of 'vaccination'. As more and more countries adopted this method of prevention, fewer and fewer people suffered from smallpox. This terrible disease has now been eradicated throughout the world.


Edward Jenner

Pasteur and the rabies inoculation

Louis Pasteur (1822-1895) applied Jenner's method of vaccination to the cure of other diseases. Pasteur was a chemist who became a bacteriologist — a person who studies the activity of bacteria. Living in the wine-growing region of France, he became interested in the chemistry of wine and then in fermentation. He proved that fermentation in wine and in milk was caused by micro-organisms and devised a method of preventing fermentation in milk. This was to heat the milk and then keep out the germs by sealing the container. Pasteurised milk, as it is known, is now in common use in many countries.

Louis Pasteur

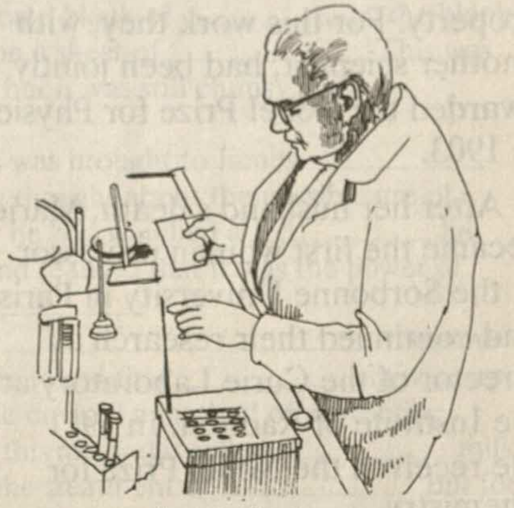
Pasteur's next important work was to devise a vaccination for anthrax, a disease which had become an epidemic in France. But he is most famous for his work on rabies or hydrophobia. He established that rabies was a virus disease and demonstrated that a weakened virus of rabies could be used for inoculation. His work on the prevention and cure of rabies greatly reduced the number of deaths resulting from this disease.

Antiseptics and chloroform

The experiments of two British surgeons in the 19th century helped to reduce pain in surgery and to increase its rate of success. Joseph Lister was interested in Pasteur's work on micro-organisms and wished to find a way to destroy them. He found that carbolic acid was an effective 'antiseptic' and that its use during surgery (on surgical instruments and on open wounds) helped prevent the wound from festering and increased the chances of recovery. Lister then patiently worked out ways to improve the antiseptics he used.

James Young Simpson (1811-1870) pioneered the use of chloroform during surgery so that the patient would not feel pain.

The discovery of penicillin



Alexander Fleming

Alexander Fleming (1881-1955) was another professor of medicine engaged in research in bacteriology. In his laboratory, he cultivated specimens from different hospital patients to study their diseases. Sometimes specimens would become mouldy and would be thrown away. But one day in 1928, Fleming noticed that the mould in a specimen dish had killed the germs around it. This was the discovery of penicillin which was to help in the cure of many diseases.

For eleven years Fleming and other doctors worked on methods to extract penicillin from the mould. In 1945, with two other researchers, Florey and Chain, Alexander Fleming was awarded the Nobel Prize for Medicine.

The X-ray

A German doctor, Wilhelm Konrad Roentgen (1845-1923) conducted experiments with electricity and discovered a radiation which could penetrate even a closed door. Because he did not know what it was, he called it X-ray. It is still known by that name and is used extensively in the practice of medicine.

During the First World War, the recently discovered X-rays were used extensively by the French scientist Marie Curie (1867-1934), who personally set up and operated the X-ray apparatus in military hospitals.

The Curies and radio-activity

With her husband Pierre Curie (1859-1906) Marie had discovered the elements radium and polonium as well as their 'radio-active' property. For this work they, with another scientist, had been jointly awarded the Nobel Prize for Physics in 1903.

After her husband's death, Marie became the first woman professor at the Sorbonne University in Paris and continued their research as director of the Curie Laboratory at the Institute of Radium. In 1911 she received the Nobel Prize for Chemistry.

Marie Curie

Radio-activity is now widely used in the treatment of cancers. But for several years after the Curies' discoveries people did not realise that radio-activity can also be harmful. Many people who worked with radium, including Marie herself, suffered from and died of what came to be known as 'radiation sickness'.

The Curies' work in radio-activity led to other important discoveries. Another scientist, Ernest Rutherford, found out that when an element gives out radio-activity, its atoms are actually breaking up and changing it into another element. From Rutherford's discovery grew modern atomic science and the use of atomic energy for peaceful purposes as well as for war.

Exercises

1. Answer briefly:

a. Who invented the movable type? How is it made?

b. What was the Industrial Revolution? Where did it begin?

c. What was the use for which the first steam engines were designed?

d. What was the 'Rocket'? Who built it, when and for what purpose?

e. Name three of Edison's major inventions.

f. Who discovered the cure for i. smallpox; ii. anthrax; iii. rabies?

g. Who discovered or invented i. pasteurised milk; ii. antiseptics; iii. chloroform; iv. penicillin; v. X-ray; vi. radio-activity?

2. Fill in the blanks:

a. Early in the __________ century, the idea of printing with __________ blocks had been brought from __________ to Europe. Each page of writing and pictures would be __________ on a block of __________, the block would be __________ and pressed on a sheet of __________. This was better than copying by __________ but it was still clumsy and __________.

b. In 1763, one of __________ engines was brought to James __________ for repairs. __________ had already thought about the possible use of __________ power. As a young boy he had watched a __________ lid jumping as the water __________ and realised that it was the power of __________ that was making it __________.

c. Living in the wine-growing region of __________, __________ became interested in the chemistry of wine. He found that __________ in wine and milk was caused by __________. He devised a method of preventing __________ in milk. Milk treated by this method is called __________ milk.

d. Radio-activity is now widely used in the treatment of __________. But for several years after it was discovered by the __________, people did not realise that it could also be __________. Many who worked with __________, including __________ __________ herself, died of what came to be known as __________ sickness.

. Give reasons why:

a. The invention of printing helped the spread of knowledge and education.

b. Antiseptics and chloroform are used in surgery.

c. A certain kind of penetrating radiation is known as X-ray.

d. Ernest Rutherford's work is regarded as the beginning of atomic science.

4. Tick the correct sentences. Correct those that are incorrect:

a. William Caxton invented the movable type before Gutenberg.

b. The first steam engines were designed to pull trains and move ships.

c. Edison invented the electric bulb by accident.
d. Jenner invented the smallpox vaccination.
e. Listerine was the first effective antiseptic.
f. Pierre and Marie Curie jointly received the Nobel Prize twice.

5. Match columns A and B:

A	B
Gutenberg	chloroform
James Watt	movable type
Simpson	X-ray
Roentgen	electric bulb
Edison	steam engine

Project work

You have learnt something about some of the great inventors and healers. Find out details about the life and work of:

1. Samuel Morse
2. Alexander Graham Bell
3. William Harvey
4. Ivan Pavlov
5. Ronald Ross

23. Voyagers

In the modern world, knowledge of any country or place can be obtained from books or other means of communication. This is because there is now no part of the world that is completely isolated. But in ancient times, when travel was slow and dangerous and there were no other means of communication, people of any one country knew little or nothing about far away places. In Europe and Asia, it was not known that continents like America and Australia existed. To travel by land or sea and explore distant places was, in those days, as great an adventure as space exploration is now. And those expeditions into the unknown were not as well-planned and organised as modern space travel.

Many of these early voyagers not only brought back to their own countries information about distant lands, but also left behind written accounts of their travels which tell us what life in those countries was like in those times. These travellers also helped increase trade.

Pilgrims from China

From the fifth century A.D., many Chinese pilgrims travelled to India to visit the places where the Buddha had lived and taught. One

Fa Hien

Hiuen Tsang

of them, Fa Hien left an account of his journey and the places he visited.

Fa Hien travelled on foot. It took him five years to reach India, walking through deserts and over mountains. In India he spent several years in Pataliputra, capital of the Gupta kingdom of Maghada. He visited centres of Buddhist learning and travelled through India to Sri Lanka. From here he returned to China by sea, experiencing many dangers on the way.

Nearly 200 years later, another Chinese pilgrim walked to India and spent sixteen years in the country. The account he has left of his travels is called 'Si-Yu-Ki', meaning 'Records of the Western World'. (India is to the west of China.) This pilgrim, Hiuen Tsang, became a Buddhist monk at 20. At 26, in 629 A.D. he left home for India. He visited many centres of Buddhist learning including the University of Nalanda. He was the guest of King Kumara of Assam, of Emperor Harshavardhana, and of Pulakesin II in the Deccan. He also visited Kanchipuram in the south. Hiuen Tsang has left a detailed account of his travels and the customs and ways of life of the kingdoms he visited. From his book, we learn much about India in the 7th century A.D.

Marco Polo

For many centuries, both China and India were strange, exotic lands to Europeans, few of whom had visited these countries. The most famous of the early European travellers to Asia is Marco Polo.

Marco Polo and Kublai Khan

In the thirteenth century, Venice, in Italy, was one of the most powerful and richest cities of Europe. Venetian merchants traded with many countries by land and sea.

Marco Polo's father and uncle were merchants who had set out for China before Marco was born. They returned when he was fifteen with wonderful stories about the court of the Chinese emperor, Kublai Khan. When they set out on their second journey to China, Marco Polo went with them. They travelled by sea across the Persian Gulf and then overland through Persia, Afghanistan and Tibet. After nearly four years of travel, they reached the court of Kublai Khan at Peking. He welcomed them and they became his trusted advisers and friends. Marco learnt to speak the Chinese language and follow the Chinese way of life and was even made governor of a Chinese province.

When they decided, after 17 years, to return to Venice, they travelled by sea. On the way, they stopped in India and visited Kanchipuram and the grave of St. Thomas the apostle at Mylapore. When they reached home after an absence of more than twenty years, they had with them great wealth in jewellery and other goods. But what lasted even longer than their wealth was the account Marco Polo wrote of his travels. It awakened European interest in the east and led to increased trade between Europe and Asia.

The search for a sea route

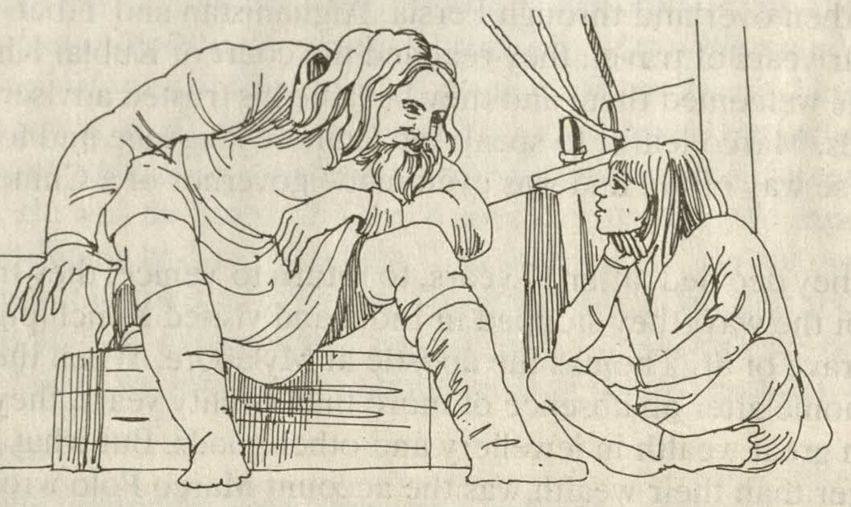
Until the end of the 15th century, European trade with India and China was carried on by the overland route through Arabia. But the Turks captured Constantinople in 1453 and blocked the land route to Asia. European merchants had to look for another route.

The Portuguese were among the first to try to find a sea route to India by sailing round Africa. In 1486, Bartholomew Diaz had reached the southern tip of Africa but had to return without going further.

In those days, most people still believed that the world was flat. But there were some who said that the earth was round and that, if a ship sailed westward over the Atlantic, it would reach Asia. The man who decided to do this was Christopher Columbus (1451-1506).

Christopher Columbus

Born in Genoa in Italy, Columbus decided, even as a young boy, to become a sailor and would listen eagerly to stories told by sailors about their voyages. When he was himself an experienced sailor, he went first to Portugal and then to Spain to persuade the rulers there to finance a voyage of discovery across the Atlantic. After many years of waiting, King Ferdinand and Queen Isabella of Spain gave him three small ships and in 1492 Columbus set sail across the Atlantic.



As a young boy Columbus listened to sailors' stories.

When they did not sight land for many weeks, his sailors grew afraid and threatened to rebel. But before they did so, they saw land. Columbus landed on an island which he named San Salvador. They sailed on and discovered other islands, including Cuba. Columbus then took back with him to Spain gold and strange plants and animals and some of the people who lived on those islands.

Christopher Columbus

Columbus later made other voyages across the Atlantic, discovering more islands and sailing along the coast of Central and South America. But until his death in 1506, he continued to believe that these were the spice islands of Asia. When it was later discovered that the continents of North and South America lay between, the islands which he had called the 'Indies' came to be known as the 'West Indies'. Columbus had discovered a 'new world' without realising it!

Vasco da Gama and Magellan

A few years after Columbus made his historic voyage, the Portuguese sailor, Vasco da Gama succeeded in sailing round Africa and reached the west coast of India. Thus the sea route to the east was finally discovered and Europeans came to Asia, first to trade and then to colonise and rule many Asian countries.

In 1519 another Portuguese, Ferdinand Magellan, set out to prove that it was possible to sail round the world. Leading a fleet of five ships he crossed the Atlantic, reaching the coast of Brazil. He sailed down the coast of South America and around its tip. Entering the calm ocean on the other side, Magellan named it the Pacific (peaceful) Ocean. They continued the voyage, but in the islands of the Pacific Magellan himself was killed in a fight with the inhabitants.

Vasco da Gama

Ferdinand Magellan

Of the five ships and 270 men who had set out, only 18 men in one ship managed to return after a difficult and dangerous journey of three years. But it had finally been established that it was possible to sail round the world.

James Cook

By the 18th century, voyages of discovery were better organised than those of Columbus and Magellan had been. In 1768 the Royal Society and the British Government sent the ship 'Endeavour' commanded by James Cook to the South Pacific. He was entrusted with several responsibilities. The first was to observe and record the transit of Venus (the passing of Venus across the face of the sun) on June 3, 1769 from Tahiti in the Pacific. He was also required to discover whether a southern continent actually existed.

At that time, various Dutch and British sailors had touched the western coast of Australia, parts of New Zealand and the coast of Tasmania. But it was not known whether these places were islands or part of a huge southern continent.

Cook sailed across the Atlantic and round the tip of South America, on to Tahiti in the Pacific, where he made the required observation of

James Cook

Cook and some shipmates among Pacific islanders the transit of Venus. He then sailed south in search of the southern continent.

Cook sailed round the North and South Islands of New Zealand, establishing that they were not part of a large continent. He then sailed along the east coast of Australia and through the Torres Strait which proved that Australia was not attached to New Guinea as some sailors had thought. He returned home across the Indian Ocean and round Africa.

Cook's voyage had taken three years. He returned to England with a large mass of carefully observed and recorded scientific detail. A skilled surveyor and a map maker, he had sailed unknown waters and mapped the entire coastline of New Zealand, as well as the east coast of Australia. He had also surveyed and mapped several islands of the Pacific. He had with him, on his voyage, a party of botanists and naturalists who made drawings of and described the strange plant and animal life of the southern lands. The records of Cook and his companions also provided detailed information about the people of these lands and their ways of life.

Cook was sent on two more voyages of discovery. In the first, searching for a southern continent, he crossed the Antarctic Circle, and sailed as far south as 71°S before his way was blocked by ice. This was the furthest south anyone had sailed until then.

In his last voyage, Cook was asked to travel north along the west coast of America to see if a passage from the Pacific to the Atlantic, to the north of the American continent was possible. Cook entered Bering Strait and sailed as far north as 70½°N before he was again stopped by ice. Returning southwards, he stopped in Hawaii. Here, fighting broke out between his crew and the islanders and Cook was killed.

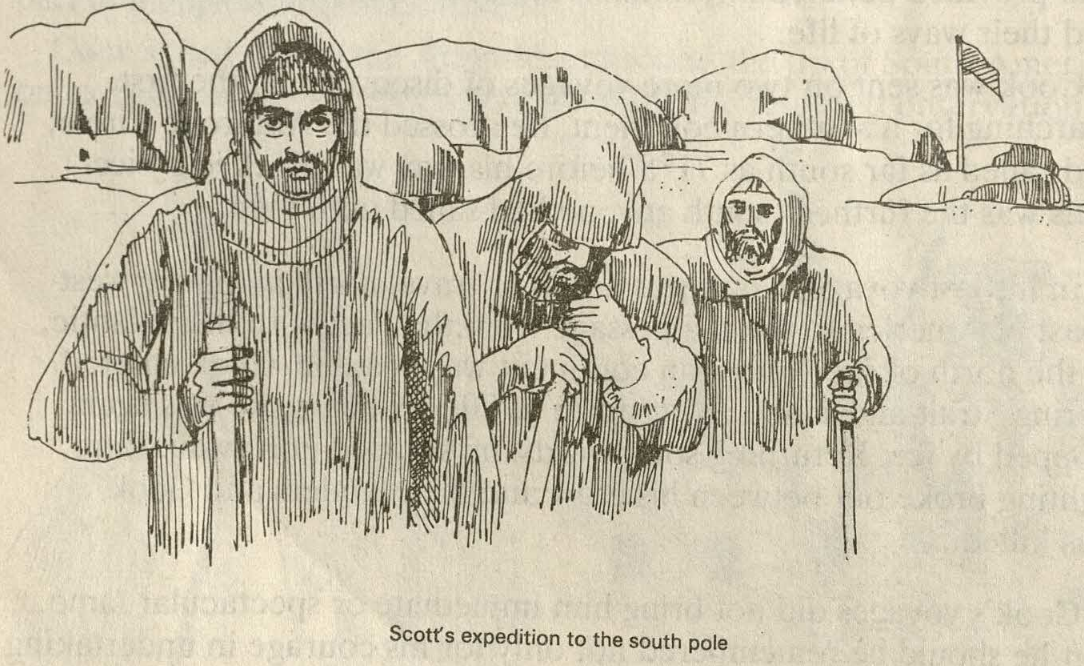
Cook's voyages did not bring him immediate or spectacular fame. But he should be remembered not only for his courage in undertaking dangerous voyages into unknown seas but also for his thoroughness and accuracy in recording what he found. He was also noted for his friendliness and fairness in his dealings with the native peoples of the new lands he found. This was a quality which was rare in European voyagers and adventurers of that period.

Journey to the south pole

When James Cook was turned back by the ice, it was not known that there was a continent around the south pole. Later, this was discovered and named Antarctica. The last great voyages of discovery on earth were attempts to reach the two poles. In 1909, the Arctic explorer Robert E. Peary reached the north pole.

Earlier, in 1901, Captain Robert Falcon Scott, with a team of scientists, had set sail for Antarctica. They spent three years on the continent making several journeys from the ship in different directions. The closest they got to the south pole was 460 miles from it.

After the expedition returned to England, one of the group, Ernest Shackleton, made another voyage to Antarctica. But when he was less than a hundred miles from the south pole, he had to give up the attempt.



Scott's expedition to the south pole

In 1910 Captain Scott set out again after making careful preparations for the expedition. Meanwhile a Norwegian group led by Captain Roald Amundsen also set out for the south pole.

The two groups travelled by different routes over Antarctica. Amundsen's expedition reached the pole first, on December 14, 1911. On January 17, 1912, Scott and four others, who had been chosen to cover the final 150 miles to the pole, arrived to find that they were not the first. But they had achieved their objective against many difficulties.

On the return journey to the expedition's camp, they had to travel against bitter winds and snow storms. One of the party was injured and died. Another was so frostbitten that he could not walk and because his presence slowed down his companions, one night he walked out of their tent and died in an unknown place. His sacrifice was in vain because his three friends also died in a blizzard when they were only eleven miles from the camp.

Several months later the tent with their bodies was found in the snow. With them were Scott's diaries which recorded their daily experience in the Antarctic snow. It was a story of courage, endurance and friendship. Their bravery in the face of death and disaster is a quality they shared with all great explorers, successful or unsuccessful.

Exercises

1. Answer briefly:
    a. Who were the two Chinese pilgrims who visited India in the 5th and 7th centuries?
    b. What is the 'Si-Yu-Ki'? Why is it so called?
    c. Why did Columbus wish to sail westwards from Europe to reach India?
    d. Which was the land that Columbus actually discovered?
    e. What were the responsibilities given to James Cook when he was sent to the Pacific Ocean?
    f. What were the nationalities of the two expeditions in the race to the south pole? Name their leaders.

2. Write a short paragraph on each of the following:
    a. Marco Polo's visit to China.
    b. Magellan's voyage round the world.
    c. The death of Captain Scott and his companions.

3. Fill in the blanks:
   - a. In ancient times, when travel was slow and __________, people of any one __________ knew little or nothing about far away __________. In Europe and __________ it was not known that continents like __________ and __________ existed.
   - b. In the thirteenth __________, __________ in Italy was one of the richest and most powerful cities of __________. __________ merchants traded with many countries by land and __________.
   - c. In those days, most __________ still believed that the world was __________. But there were some who said it was __________ and that, if a ship sailed __________ over the Atlantic, it would reach __________.
   - d. The last great voyages of discovery on __________ were attempts to reach the two __________. In 1909, Robert Peary reached the north __________.

4. Match columns A and B:

A	B
Hiuen Tsang	south pole
Kublai Khan	sea route to India
Vasco da Gama	Chinese emperor
Roald Amundsen	Australia
James Cook	Chinese pilgrim

5. Tick the correct sentences. Correct those that are incorrect:
   - a. Fa Hien travelled on foot from China to India and took five years to complete the journey.
   - b. The Polos returned directly from China to Venice by sea.
   - c. In the 15th century European merchants looked for a sea route to India because the land route took too long.
   - d. On his second voyage Columbus realised that he had discovered America.
   - e. Magellan completed his voyage round the world and returned to Portugal.

6. Give reasons why:
   - a. The Pacific Ocean received this name.
   - b. James Cook had to reach Tahiti before June 1769.
   - c. The sailors under Columbus threatened to rebel.
   - d. Cook did not discover Antarctica.
   - e. We know details of Scott's return journey from the south pole although he and all his companions died on the way.

Project work

Did you know that many countries now send teams of scientists to Antarctica? Find out details of the expeditions sent there by India.

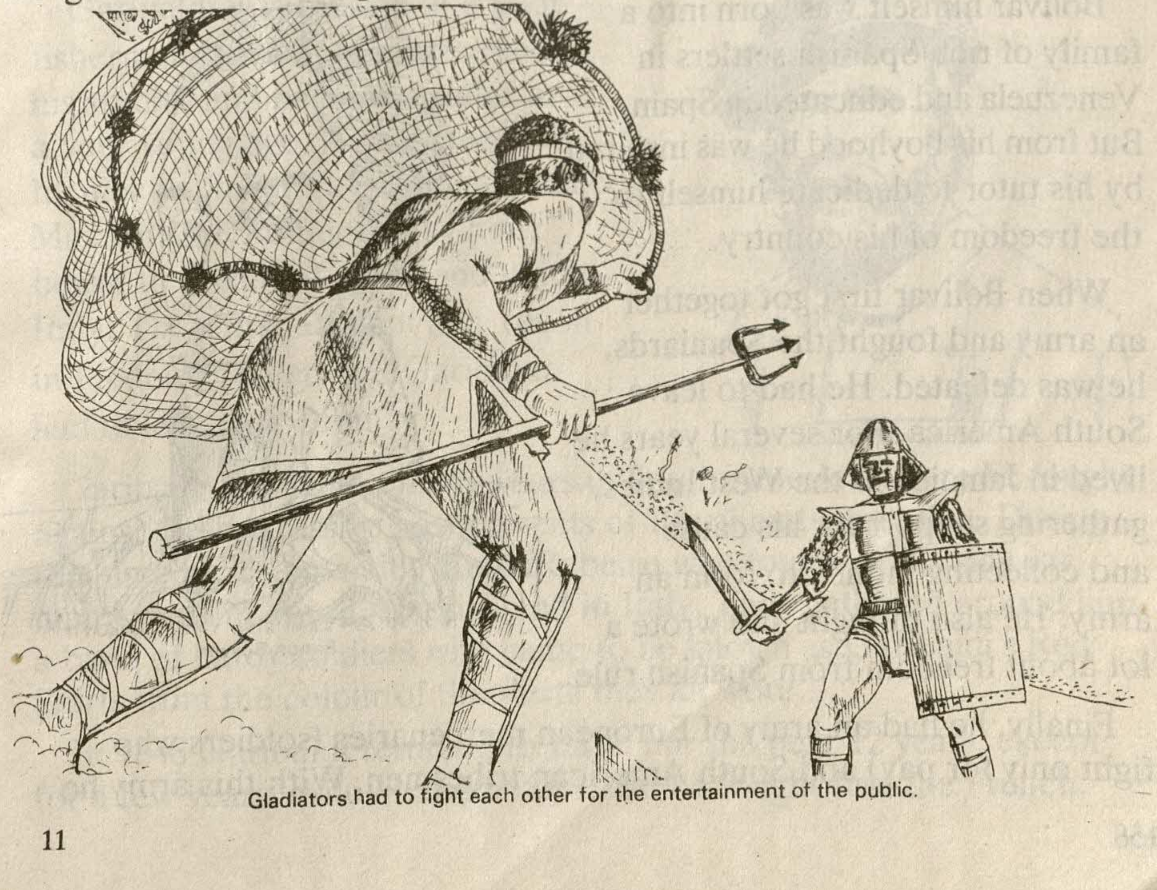
24. Fighters against oppression

Oppression means harsh or unjust exercise of power. As far back as human history has been recorded, there has been oppression, with the strong ruling over the weak. But, equally, there have been frequent examples of people fighting against oppression either as individuals or as groups.

Oppression can be political, religious, social, economic or a combination of these factors. Here we will learn about some of the people who fought oppression in their time.

Spartacus

In the days of the Roman empire slaves and prisoners were trained as 'gladiators'. These gladiators had to fight each other or wild animals



Gladiators had to fight each other for the entertainment of the public.

for the entertainment of the public. The death of the man who lost the fight was also regarded as entertainment by the watchers. In the first century B.C. one of the slaves organised a revolt against this inhuman system. Spartacus was a slave trained as a gladiator and for a short period his revolt was successful because he and his friends succeeded in freeing many others and gathering a large army of slaves. But they were defeated by the Roman army and many of them, including Spartacus, were executed. Though the revolt failed Spartacus stands as an example of heroism in the cause of human freedom.

Simon Bolivar

From the 16th century onwards, European voyages of trade and discovery increased greatly. As a result, over the next few centuries, several European countries conquered and colonised various parts of the world. Spain conquered and ruled South America. Spanish rule was harsh and oppressive. The man who fought and defeated Spanish power in that continent was Simon Bolivar (1783-1830).

Bolivar himself was born into a family of rich Spanish settlers in Venezuela and educated in Spain. But from his boyhood he was inspired by his tutor to dedicate himself to the freedom of his country.

When Bolivar first got together an army and fought the Spaniards, he was defeated. He had to leave South America. For several years he lived in Jamaica in the West Indies, gathering support for his cause and collecting money to form an army. He also thought and wrote a lot about freedom from Spanish rule.

Simon Bolivar

Finally, he had an army of European mercenaries (soldiers who fight only for pay) and South American tribesmen. With this army he managed to drive the Spaniards out of Venezuela. He then crossed the snow-covered Andes with his army, surprised the Spaniards in neighbouring Colombia and defeated them there as well.

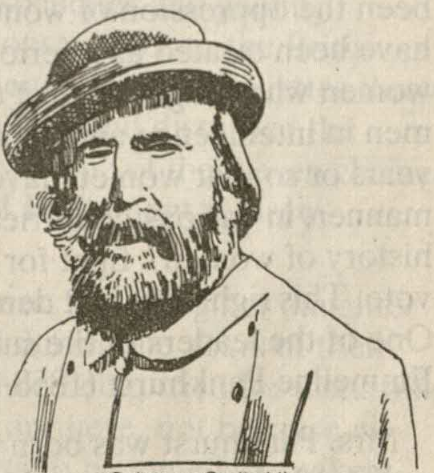
Now that Venezuela and Colombia were free he continued south with his army to defeat the Spaniards in Peru, Argentina and Chile. By 1824 there were no Spanish colonies in South America.

Bolivar is known as the 'Liberator' all over South America. A new country, formed after the Spaniards left the continent, was named 'Bolivia'.

Guiseppe Garibaldi

In the early part of the nineteenth century Italy, in Europe, was divided into several parts each ruled by a different foreign power. The only parts of the country under Italian rule were Piedmont and Sardinia. The man who united Italy and got rid of all the foreign rulers was Guiseppe Garibaldi (1807-1882).

Garibaldi was the son of a poor fisherman. He was not interested in his studies and became a sailor at a very young age. As a young man he met an Italian revolutionary called Mazzini and, influenced by him, began to dream of a free and united Italy. Their first attempt at a revolt in Piedmont failed and Garibaldi had to leave the country.


Guiseppe Garibaldi

Garibaldi then spent many years in South America where he fought against the oppressive governments of Brazil and Argentina. During this time he also married Anita Rebeiro who fought at his side for many years in South America and in Italy. They gathered around him a band of hardy soldiers who came to be known as Garibaldi's Red Shirts from the colour of the shirts they all wore.

In 1848 Garibaldi returned to Italy. For the next 12 years, except for a few years' exile in South America, he fought first the French, then the Austrians and then the King of Naples. During the campaign against the French his wife, who had fought at his side, died.

In his fight against the Austrians Garibaldi had the support of the Italian state of Piedmont. Finally, he was successful in uniting all of Italy except Rome.

Garibaldi was then so popular among the people that he could have become the ruler of at least a part of the country. But he was not interested in power and gave the united country to King Victor Emmanuel of Piedmont. He then retired to an island farm near Sardinia and spent the rest of his life farming. During his lifetime, he had the satisfaction of knowing that Rome, too, had been united with the rest of Italy, in 1870.

Emmeline Pankhurst

Among the most common and continuous kinds of oppression has been the oppression of women by men. In almost all societies women have been treated as inferior to men. In earlier times, there have been women who fought against this and proved that they were the equal of men in intelligence and capability. But it is only in the last hundred years or so that women have fought for equality in an organised manner, in various countries. One of the important struggles in the history of women's fight for equality was the struggle for the right to vote. This right was first demanded by women in England and America. One of the leaders of the suffragette movement in England was Emmeline Pankhurst (1858-1928). Suffrage means the right to vote.

Mrs. Pankhurst was born Emmeline Goulden, the daughter of a well-to-do businessman. Her husband, Dr. Pankhurst, was known for his very 'radical' opinions which means that his beliefs were much in advance of his times. He also believed in greater freedom for women. For several years Mrs. Pankhurst worked with her husband for social causes like the improvement of workhouses to which poor people were sent.

It was only after her husband's death in 1898 that Mrs. Pankhurst gave all her time and energies to the cause of women's suffrage. Her methods caused controversy because in those days it was not

Emmeline Pankhurst

A suffragette demonstration

thought 'ladylike' behaviour for women to shout, argue and demonstrate in crowds. For several years, Mrs. Pankhurst travelled widely in England, the U.S.A. and Canada making speeches and gaining support for the cause. She organised demonstrations to the British Parliament and the Prime Minister's residence. The suffragettes threw leaflets from the visitors' gallery in Parliament and disturbed the proceedings by shouting out their demands. Some of them even chained themselves to the railings of the Houses of Parliament to draw attention to their demands.

Mrs. Pankhurst and many of her followers, including her daughter Christabel, were imprisoned several times during the years of their struggle for the vote. On one occasion, while being tried for disturbing the peace, Mrs. Pankhurst declared: 'We are here, not because we are law-breakers; we are here in our efforts to become law-makers.' In prison, she and many other suffragettes went on hunger-strike.

When the First World War broke out in 1914, the British suffragettes suspended their agitation in order to cooperate with the government during the war.

When the war ended, in 1918, the government extended the right to vote to women over thirty. Much later, the voting age was made the same for men and women.

For another ten years, until her death at the age of seventy, Mrs. Pankhurst continued to take an active part in British politics though she did not succeed in getting elected to Parliament.

Lenin

Until the beginning of the 20th century, Russia was ruled by emperors known as 'tsars'. Rule by the tsars was usually oppressive. Most people were poor. The country's wealth was in the hands of the ruling family and a few nobles.

When the people protested against oppression they were punished harshly, as on January 22, 1905. On that day, several thousand Russians marched in a procession to tell the tsar their grievances. But the army was called out to shoot them down and many died on 'Bloody Sunday' as it came to be called. Foremost among the revolutionaries who fought against the tsar's government and defeated it was Lenin.

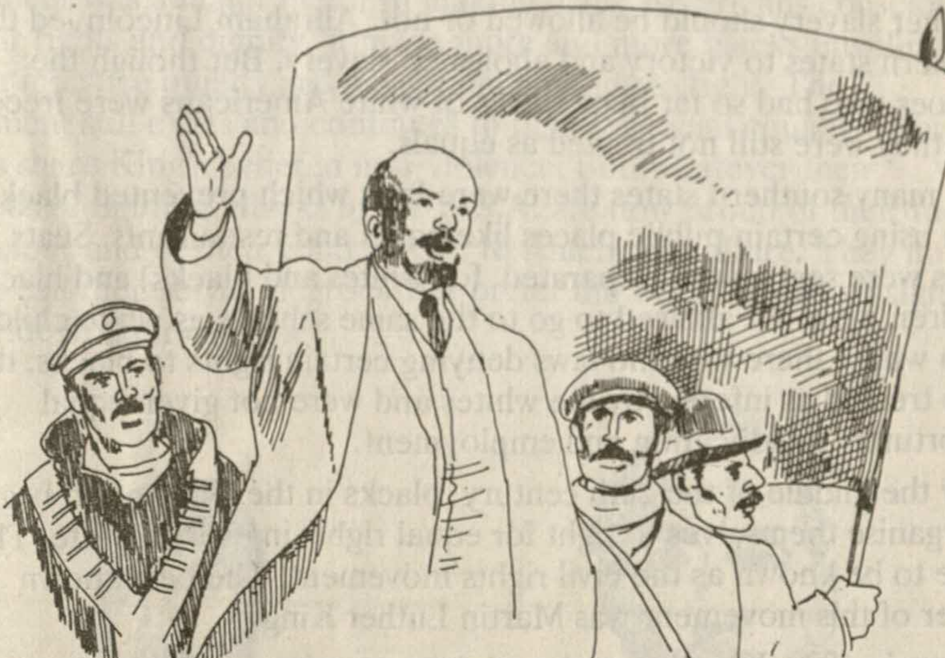
'Lenin' was actually the pen-name of Vladimir Ilyich Ulyanov who was born in 1870 and came of a fairly well-to-do family. When Lenin was seventeen, his elder brother was hanged for taking part in a plot to assassinate the tsar. This made Lenin think seriously about the political situation in the country. He came to the conclusion that his brother was right to have opposed the government but that other methods of defeating it would have to be found.

While training to be a lawyer Lenin began studying the works of Karl Marx, a 19th century German thinker. Marx believed that the working class, which was oppressed by the rich and powerful, should bring about a revolution which would result in a more equal distribution of wealth. Lenin became a 'Marxist' (as people who believe in Marx' philosophy are called) and decided to devote his life to bringing about the revolution. He joined others of the same belief and soon became their leader. Lenin worked hard to spread their beliefs among more and more people and wrote about these beliefs and about conditions in Russia. Because the government disapproved of his writings he was imprisoned and later exiled to Siberia, the cold northern area of Russia where many prisoners were sent.

In 1900 Lenin was allowed to leave Russia. He lived first in England

and then in Switzerland, still writing and working for the revolution.

The First World War broke out in 1914 and Russia fought in it against Germany. But the government organised the fighting so badly that large numbers of soldiers died and people all over the country suffered great hardship.



Lenin

In 1917, Lenin in Switzerland received the news that the tsar's government had been overthrown. He immediately rushed to Russia. Because he was more efficient and determined than the people who first overthrew the tsar and because he knew exactly what to do next, he was able to take over and direct the course of the revolution.

In organising the government after 1917 Lenin showed his true greatness. He brought the war with Germany to a speedy end. He entirely rebuilt the political and economic structure of Russia so that it became a Marxist state. In doing this he also began the process by which Russia changed from a backward, agricultural country to a modern industrialised nation.

Lenin died in January 1924, at the age of 53. He was both thinker and man of action. He laid the foundations of a Marxist state in

Russia. With his writings he made an important contribution to Marxist philosophy.

Martin Luther King

In the 19th century a civil war was fought in the U.S.A. to decide whether slavery should be allowed or not. Abraham Lincoln led the northern states to victory and abolished slavery. But though the negroes who had so far been slaves of white Americans were freed by law, they were still not treated as equals.

In many southern states there were laws which prevented blacks from using certain public places like parks and restaurants. Seats in buses were segregated (separated, for whites and blacks) and black children were not allowed to go to the same schools as white children. Even where there were no laws denying certain rights to blacks, they were treated as inferior by the whites and were not given equal opportunity in education and employment.

By the middle of the 20th century, blacks in the U.S.A. had begun to organise themselves to fight for equal rights in everyday life. This came to be known as the civil rights movement. The best known leader of this movement was Martin Luther King.

Born in 1929, King became a minister or priest in the southern state of Alabama in 1954. He also became an active member of the National Association for the Advancement of Coloured People (NAACP).

King's first major campaign in the civil rights movement took place in 1955 in the city of Montgomery in Alabama. A black woman was arrested for going against the law of segregation in a bus. King organised the blacks of the city to boycott all buses. The action was successful and the bus segregation laws were withdrawn.

King then continued the fight for equality on a larger scale and the civil rights movement under his leadership spread to many states in the U.S.A. The important factor in King's life and work was that he believed in non-violence and used only peaceful methods of protest and civil disobedience in all his campaigns. King himself said that he had been deeply influenced by Gandhi's life and beliefs and he thought of his visit to India in 1959 as a pilgrimage to Gandhi's country.

Martin Luther King was awarded the Nobel Prize for Peace in 1964. In April 1968, while addressing a large meeting, he was shot dead by an assassin.

King's achievement does not consist only of the concrete legal rights that he succeeded in winning for blacks. His civil rights movement was a major factor in making black Americans conscious of their rights and dignity. It made more and more blacks unwilling to accept injustice quietly and gave them courage to fight. The movement still exists and continues to fight for racial equality. Not all blacks share King's belief in non-violence. But, whatever their methods of fighting, blacks in the U.S.A. are now proud of their race and colour and of their contribution to American culture. They no longer call themselves 'negroes' but prefer the word 'blacks' to signify this pride in their own race.

Martin Luther King

Ho Chi Minh

Ho Chi Minh

In the 20th century, many countries fought to gain independence from colonial rule. One of the longest and hardest freedom struggles was waged by Vietnam in southeast Asia. Until the Second World War, Vietnam was part of the French empire. During the war it was conquered by the Japanese. After Japan's defeat the French again occupied part of Vietnam. The man who led the Vietnamese people in the fight against the French, the Japanese and, later, the Americans, was Ho Chi Minh (1890-1969).

In his youth Ho Chi Minh worked as a primary school teacher and then as a ship's steward. During the First World War he worked in a London hotel. Moving to Paris at the end of the war, he tried to raise the question of Vietnamese independence among delegates to the peace conference which met in Paris. He also wrote several articles and was a founder-member of the French Communist Party. Like Lenin, Ho Chi Minh was a Marxist.

Before returning to Vietnam in 1940 he spent several years in Moscow and in China. During the Second World War he organised resistance to the Japanese who had occupied the country. When the Japanese withdrew in 1945, Ho Chi Minh declared Vietnam a democratic republic. But the French returned and occupied the southern part of the country.

From 1946 to 1954, Ho and his fellow Vietnamese fought a war of independence against the French and won a major victory in the final battle. According to the Geneva Agreement of that year, Vietnam was partitioned into North Vietnam, with Ho Chi Minh at the head of a communist government, and South Vietnam, where the government was anti-communist. However, communists in the south as well as the North Vietnamese wished to unite the country under Ho Chi Minh and fighting continued. From 1965 to 1973, the U.S.A., which is opposed to communism, fought against the North Vietnamese in support of the South Vietnamese government. But, in spite of the great military power of the U.S.A., the Vietnamese won the war. This was because the South Vietnamese government was corrupt and lost the support of the people; the American people did not want to fight in Vietnam; and the communists fought with great determination.

Ho did not live to see the unification of Vietnam in 1975. He died in 1969. But he was the architect of the unity and independence of Vietnam. All his adult life was spent in struggle and war. But even while engaged in war, as President of North Vietnam, he implemented major land reforms for the welfare of the poor and began the industrialisation of the country.

Exercises

1. Answer briefly:
    - a. Who was Spartacus?
    - b. Which countries were liberated by Bolivar?
    - c. What did Garibaldi achieve through his many years of fighting?
    - d. What was the suffragette movement? Who led it and how far was it successful?
    - e. Who was the thinker who influenced Lenin the most? Explain his philosophy.
    - f. Name the movement of which Martin Luther King was a leader and the organisation of which he was a member.
    - g. Why did the Vietnamese continue fighting even after the French left the country?

2. Fill in the blanks:
    - a. When Bolivar first got together an ____________ and fought the ____________, he was defeated. He had to leave South ____________. For several years he lived in ____________ in the West ____________, gathering support for his cause and collecting ____________ to form an ____________. He also thought and wrote a lot about freedom from ____________ ____________.
    - b. When he had freed and united Italy, ____________ was so popular that he could have become the ____________ of a part of the country. But he was not interested in ____________ and gave the united country to ____________ ____________ ____________ of ____________. He then retired to an island farm near ____________.
    - c. In organising the ____________ after 1917 Lenin showed his true greatness. He brought the war with ____________ to a speedy end. He entirely rebuilt the political and economic structure of ____________ so that it became a ____________ state. In doing this he began the process by which ____________ changed from a backward ____________ country to a modern ____________ nation.

3. Give reasons why:
    - a. The suffragettes suspended their agitation in 1914.
    - b. Lenin was able to take over and direct the revolution in 1917.
    - c. Martin Luther King organised the blacks of Montgomery to boycott buses.
    - d. The U.S.A. lost the war in Vietnam.

4. Tick the correct sentences. Correct those that are incorrect:
    - a. Bolivar is called the 'Liberator' because he freed Bolivia from Spanish rule.
    - b. Garibaldi fought for the King of Naples against the French and the Austrians.
    - c. Dr. Pankhurst supported the suffragette movement led by his wife.

d. Lenin believed that his brother was right to have opposed the tsarist government.

e. King was shot dead during the ceremony in which he was awarded the Nobel Prize for Peace.

f. Ho Chi Minh unified North and South Vietnam.

5. Match columns A and B:

A	B
Spartacus	Russian revolutionary
Garibaldi	suffragette
Bolivar	Vietnamese communist
Lenin	civil rights leader
Ho Chi Minh	Italian patriot
Mrs. Pankhurst	Roman gladiator
Martin Luther King	South American liberator

Project work

The French Revolution was one of the major uprisings against oppression in European history. Find out when it occurred; who revolted against whom and why; what was the motto of the French Revolution.

25. The struggle against apartheid

You have learnt how, in the U.S.A., blacks who were brought from Africa as slaves were denied equal rights even after they were legally freed. But, in their own homeland of Africa, there is a country in which large numbers of blacks are ruled by a small number of white people in an unjust and oppressive manner.

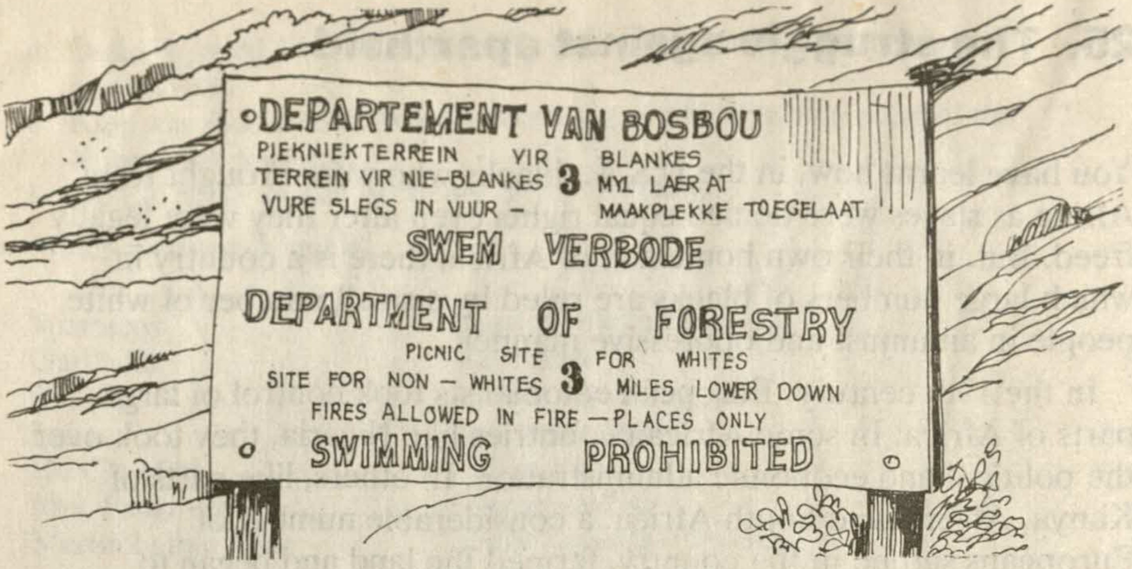
In the 19th century, European colonialists took control of large parts of Africa. In some African countries like Nigeria, they took over the political and economic administration. In others, like parts of Kenya, Algeria and South Africa, a considerable number of Europeans settled in the country, farmed the land and began to consider it their home. Since they considered the native Africans inferior to them, the local people were either driven off the land or made to work for the white settlers.

In South Africa, most of the white settlers were of Dutch descent and were called Boers. There were also some English settlers. Because the English army was stronger, four colonies of Boer and English settlers were united to form the Union of South Africa under the British Crown in 1910.

Separation of races

From the time of its formation South Africa has followed a policy of 'apartheid' or separation of races. In practice this means that the white minority (lesser number) rule over the black majority (larger number). All the political power and economic wealth is in the hands of whites. The blacks cannot vote or get elected to Parliament. They cannot live in areas reserved for whites and they are restricted to certain kinds of work. Separateness is applied to every aspect of life and even friendship between people of different races is prohibited.

South Africa also has a small population of Indians and 'coloureds' or people of mixed race. These two groups are also kept separate by South African law. Non-white people have no civil rights and are subject to questioning and arrest without reason.


DEPARTEMENT VAN BOSBOU
PIEKNIEKTERREIN VIR BLANKES
TERREIN VIR NIE-BLANKES 3 MYL LAER AT
VURE SLEGS IN VUUR - MAAKPLEKKE TOEGELAAT
SWEM VERBODE
DEPARTMENT OF FORESTRY
PICNIC SITE FOR WHITES
SITE FOR NON - WHITES 3 MILES LOWER DOWN
FIRES ALLOWED IN FIRE — PLACES ONLY
SWIMMING PROHIBITED

An apartheid notice in South Africa

The African National Congress

Many non-whites have protested against this system of apartheid. Since the Second World War this protest has grown and become more organised as more and more blacks refuse to accept oppression meekly. One of the oldest organisations of anti-apartheid protest is the African National Congress (ANC) formed in 1912. The ANC cooperated with the South African Indian community in organising protest against apartheid. (Gandhi, during his stay in South Africa from 1907 to 1914, organised civil disobedience among Indians in South Africa to protest against apartheid.)

Under the leadership of Albert Luthuli, from 1952 until his death in 1967, the ANC mainly followed non-violent tactics of protest. During this period many young Africans left the ANC because they did not agree with its methods. But the government of South Africa considered it a dangerous organisation and it was declared illegal in 1961.

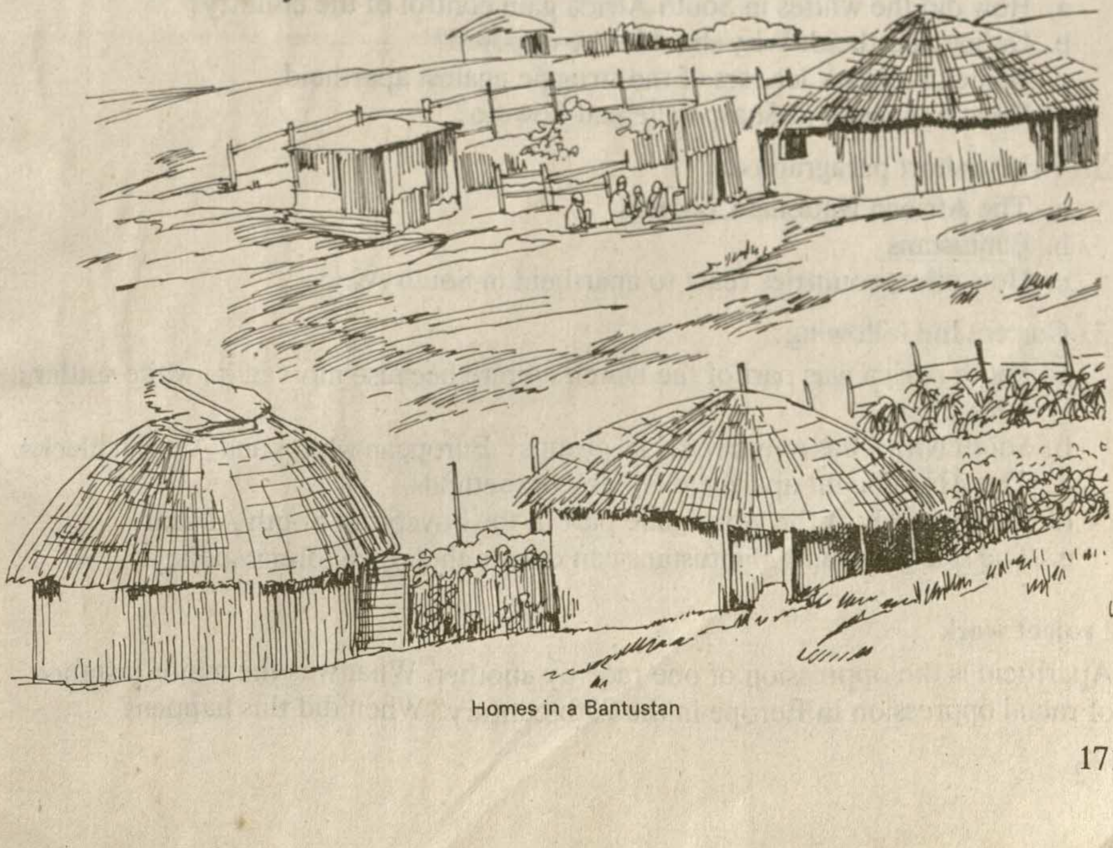
Many black leaders like Steve Biko (who died in police custody in 1977) and Nelson Mandela have been imprisoned. Others have had to leave the country to escape arrest. White persons who oppose apartheid and have joined the blacks to fight it also suffer imprisonment and ill-treatment.

Over the years there have been several occasions when blacks have risen in protest. On each occasion the white regime has resorted to brutal force and shooting down of the protesters. Two such shootings occurred at Sharpeville in 1960 and at Soweto in 1976.

Most countries of the world have condemned South Africa's policy of apartheid. Condemnation of the policy by the British Commonwealth led to South Africa leaving that association. In the U.N., a policy of boycott (not having any connections with South Africa) has been recommended. Many countries, like India, follow this recommendation. But South Africa has rich mineral resources and there are countries which trade with South Africa because they need these minerals.

Bantustans

In the last 20 years, the South African government has tried to make it appear that while apartheid keeps the races separate, it does not mean domination of blacks by whites. For this purpose a number of self-governing states called 'Bantustans' are being set up within South Africa. Each of them is supposed to represent a tribe or group of tribes and every black in South Africa will be the citizen of one of



Homes in a Bantustan

these Bantustans, depending on the tribe to which he belongs. This arrangement, while pretending to give blacks some independence, actually deprives them further. The best land is kept for the whites. The economies of the Bantustans depend on the surrounding white country where most of the blacks have to go to work. The so-called independent governments of these Bantustans have to follow the dictates of the white South African government.

Most black South Africans are opposed to this arrangement. Opponents of apartheid realise that Bantustans are only an extension of that oppressive policy. The white minority continues to stay in power in South Africa because it controls the land, mineral and industrial wealth of the country and because it uses the army and the police to maintain its rule. However, more and more black South Africans are joining in the struggle against apartheid.

Exercises

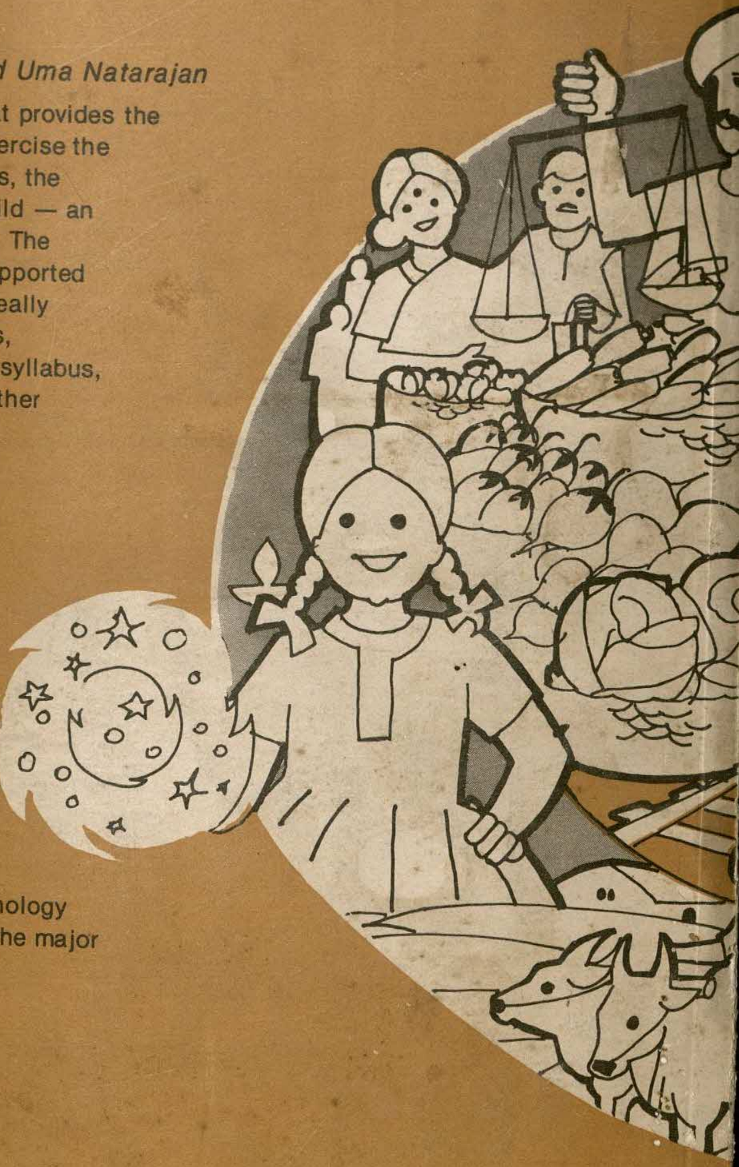
1. Answer briefly:
   - a. How did the whites in South Africa gain control of the country?
   - b. Define apartheid. Why should it be opposed?
   - c. Name two black leaders of the struggle against apartheid.
   - d. What happened at Sharpeville and Soweto?
2. Write a short paragraph on:
   - a. The African National Congress
   - b. Bantustans
   - c. How other countries react to apartheid in South Africa
3. Correct the following:
   - a. South Africa was part of the Dutch empire because most of its white settlers were Boers.
   - b. South Africa has only two racial groups: European whites and African blacks.
   - c. The ANC fought apartheid by violent methods.
   - d. All countries of the world take part in the boycott of South Africa.
   - e. The self-governing Bantustans can decide their own foreign policy.

roject work

Apartheid is the oppression of one race by another. What was the major instance of racial oppression in Europe in the 20th century? When did this happen?

The Way We Live

ALSO FROM ORIENT LONGMAN



DISCOVERING SCIENCE

Gomathi Krishnamachari, I.B. Kakar and Uma Natarajan

A series of five books for primary school that provides the child with scope to develop the mind and exercise the imagination. Written by experienced teachers, the series aims to arouse the curiosity of the child — an essential factor in the study of the sciences. The emphasis on simplicity and clarity of text supported by accurate and attractive illustrations, is ideally suited to the primary school child. The books, planned carefully on the lines of the NCERT syllabus, also take into account the requirements of other primary school systems.

NUMBERWORLD

Primary School Mathematics

K. Alamelu

These six books represent an attempt to get away from the study of mathematics as a mere classroom 'subject' and discipline. A blend of traditional and modern mathematics, Numberworld presents mathematics as an experience of numbers, patterns and relationships in everyday living. At the same time, the books follow carefully and consistently thought-out principles and terminology of the science, and the recommendations of the major primary-level syllabi.

Orient Longman

ISBN 0 86131 478 6

1990
Rs 20.00